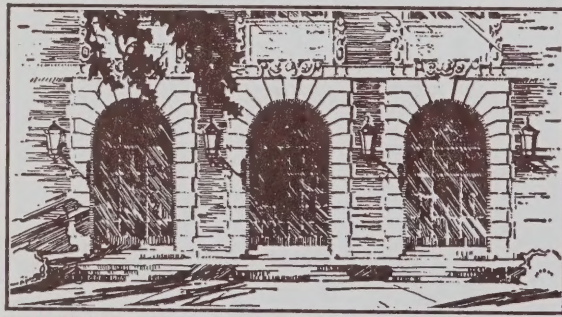


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FURNITURE MANUFACTURING and WOOD USE in the NORTH CENTRAL REGION



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FURNITURE MANUFACTURING AND WOOD USE IN THE NORTH CENTRAL REGION

THE MAKING OF FURNITURE is one of man's oldest arts. Until recent times, almost all furniture was made of wood. Today, wood in the form of lumber, plywood, hardboard, or particleboard continues to be the dominant material used, but metals, plastics, and other nonwood materials are becoming common. Wood is used for furniture because it is aesthetically pleasing, because it can be worked and finished by relatively simple processes, and because it is available in several interchangeable forms, sizes, and species at the point of furniture manufacture.

This study is concerned with furniture design and with the technical and economic factors which affect the markets for wood in the furniture industry. The particular geographical focus is the North Central Region¹—its wood furniture industry and forest resources. Some timber grown in the North Central Region is converted into hardboard, particleboard, and lumber and then is used in furniture manufacture within the Region. But most of these materials are imported from states outside the Region. The major objectives of this study are to discover why native woods are not used to a greater extent and to suggest alternatives that would lead to their greater use. The potential for improved forest resource management in the Region is closely related to prospects for expanded markets for the Region's timber products.

IMPORTANCE OF THE FURNITURE INDUSTRY

Relatively little attention has been given to the study of furniture manufacture on a national basis. Wickman (16)² suggests, "... this has been because events in the furniture industry have seemed less exciting than others in the economic milieu; because of the inaccessibility and lack of organization of data dealing with the industry; or possibly because the industry seemed relatively unimportant and therefore not worthy of a more generous allotment of the economist's scarce time resources!" This is surprising because furniture manufacture is a significant if not a heavy contributor to the nation's total manufacturing employment or value added in manufacture. In 1963, there were

¹ The eight states of the North Central Region that participated in this study are Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. In this bulletin the terms "Region" or "North Central Region" are used to refer to these states.

² This and similar references are listed in Literature Cited on page 66.

8,069 companies controlling 10,478 plants that manufactured all kinds of furniture in the United States. The industry provided employment for 376,329 persons with a total payroll of 1.7 billion dollars. The value of all shipments was 5.9 billion dollars. The furniture industry is of greater relative importance in certain regional and local economies.

Lumber, veneer, plywood, hardboard, and particleboard are the most important wood products used in furniture manufacture. In 1960, manufacture of furniture and fixtures accounted for 16 percent of all lumber used in manufacture, 18 percent of all veneer, 28 percent of all plywood, 27 percent of all hardboard, and 63 percent of all particleboard (13). Consequently, furniture is an important market for forest products. By 1965, wood furniture and fixture manufacture accounted for 21 percent of all lumber used in manufacture, 29 percent of all veneer, 33 percent of all plywood, 32 percent of all hardboard, and 60 percent of all particleboard (Table 1).

The term "furniture" is used loosely. Actually this "commodity" is not easily described and, indeed, cannot be rigorously defined. As is the case with many other industries, the inclusion and exclusion of certain products in the several types of furniture industries are matters of arbitrary selection or convenience. Only four of the 11 major furniture categories or industries described by the Bureau of Census are covered in this study. In 1965, the four furniture sectors together accounted for 90 percent of all lumber, 97 percent of all veneer, 77 percent of all plywood, 78 percent of the hardboard, and 65 percent of all particleboard used in furniture manufacture. The four sectors are:¹

SIC 2511 — wood household furniture (not upholstered);

SIC 2512 — wood household furniture (upholstered);

SIC 2521 — wood office furniture;

SIC 2531 — public building furniture.

The most important materials used in the four furniture categories covered in this study are wood, metals, and fabrics. Wood in the form of lumber is the single most important material, but it has been losing ground to substitute materials. In 1948, for example, over 2 billion board feet of lumber were used in the four most important wood-using furniture categories. By 1965, about the same amount of lumber was used (2.3 billion board feet) despite the fact that the amount of furniture produced was about double the amount produced in 1948. The use of plywood, veneer, hardboard, particleboard, metals, and plastics

¹ SIC = Standard Industrial Classification as established by the U.S. Bureau of the Census in (10). See Appendix B for a listing of the types of furniture in each SIC category.

Table 1.—Wood Use by All Industry and by the Furniture-Manufacturing Industry in the United States in 1960 and 1965

	Form of wood					
	Lumber		Veneer		Plywood	
	Volume ^a	Per- cent ^b	Volume ^c	Per- cent ^b	Volume ^d	Per- cent ^b
Wood used in all manufacturing.....	11,742.9	100	4,436.4	100	2,819.8	100
Wood used in manufacturing all furni- ture and fixtures.....	1,960.6	16	804.3	18	775.8	28
Wood used in manufacturing furniture in SIC's 2511, 2512, 2521, and 2531...	1,662.6	14	780.5	17	501.5	18
Wood used in all manufacturing.....	12,493.4	100	4,352.0	100	2,104.4	100
Wood used in manufacturing all furni- ture and fixtures.....	2,596.3	21	1,264.1	29	690.1	33
Wood used in manufacturing furniture in SIC's 2511, 2512, 2521, and 2531...	2,335.2	19	1,227.0	28	529.3	25
Wood used in SIC 2511.....	1,658.8	63	1,098.6	87	442.5	64
Wood used in SIC 2512.....	560.8	22	15.7	1	35.0	5
Wood used in SIC 2521.....	48.9	2	43.4	3	14.9	2
Wood used in SIC 2531.....	66.7	3	69.3	6	36.9	6
Wood used in fixtures manufacturing...	261.7	10	37.1	3	160.8	23
Wood used in all manufacturing.....	12,493.4	100	4,352.0	100	2,104.4	100
Wood used in manufacturing all furni- ture and fixtures.....	2,596.3	21	1,264.1	29	690.1	33
Wood used in manufacturing furniture in SIC's 2511, 2512, 2521, and 2531...	2,335.2	19	1,227.0	28	529.3	25
Wood used in SIC 2511.....	1,658.8	63	1,098.6	87	442.5	64
Wood used in SIC 2512.....	560.8	22	15.7	1	35.0	5
Wood used in SIC 2521.....	48.9	2	43.4	3	14.9	2
Wood used in SIC 2531.....	66.7	3	69.3	6	36.9	6
Wood used in fixtures manufacturing...	261.7	10	37.1	3	160.8	23

^a Million board feet.^b Percentages are of total of wood used in all manufacturing except for the figures for wood used in the individual SIC's 2511, 2512, 2521, and 2531 in 1965, and for wood used in fixtures manufacturing in 1965, which are percentages of wood used in furniture and fixtures manufacturing in 1965.^c Million square feet, surface measure.^d Million square feet, $\frac{3}{8}$ -inch basis.^e Million square feet, $\frac{1}{8}$ -inch basis.^f Million square feet, $\frac{3}{4}$ -inch basis.^g Million square feet, $\frac{1}{4}$ -inch basis.

Source: The data for 1960 are taken from (13, Table 1). The 1965 data are taken from (15).

increased over this same 17-year period. Reasons for the changing mix of raw materials used in furniture manufacture are examined in this study.

WHERE IS FURNITURE MADE?

Furniture manufacture occurs in many places, but it is concentrated in five more or less clearly defined areas. These are the New England States, especially Massachusetts, New Hampshire, Vermont, and Connecticut; the Middle Atlantic States, including New York and Pennsylvania; the South, especially North Carolina and Tennessee; the Midwest, particularly Indiana, Michigan, Ohio, and Illinois; and the Far West, primarily California. The relative importance of the several areas and states varies, depending upon the kind of furniture made and the criterion of measurement used. The five most important areas are compared in Table 2 in terms of number of establishments, number of employees, payroll, and value added in furniture manufacture.

Table 2. — Ranking of the Five Most Important Wood Furniture Regions (U.S. Bureau of the Census), by Kind of Furniture, 1963

Bureau of Census Region	SIC 2511				SIC 2512			
	No. of estab- lish- ments	No. of em- ploy- ees	Pay- roll	Value added	No. of estab- lish- ments	No. of em- ploy- ees	Pay- roll	Value added
<i>Percent of U.S. total</i>								
North Central....	20	18	20	19	18	19	20	20
Middle Atlantic...	24	12	13	12	21	12	13	12
South Atlantic....	16	37	34	37	20	30	26	27
East South Central	6	10	9	8	7	15	11	11
Far West.....	19	8	10	9	19	12	15	14
Total.....	85	85	86	85	85	88	85	84
Bureau of Census Region	SIC 2521				SIC 2531			
	No. of estab- lish- ments	No. of em- ploy- ees	Pay- roll	Value added	No. of estab- lish- ments	No. of em- ploy- ees	Pay- roll	Value added
<i>Percent of U.S. total</i>								
North Central....	19	35	36	35	35	45	51	52
Middle Atlantic...	33	29	30	30	14	9	9	8
South Atlantic....	21	27	22	25	13	13	10	8
East South Central }					7	4	3	2
Far West.....	22	5	6	6	17	10	11	11
Total.....	95	96	94	96	86	81	84	81

Source: (10).

Regional rankings on the basis of number of employees, size of payrolls, and value added in furniture manufacture are identical, but ranking in terms of number of establishments is somewhat different. Using these criteria, the South Atlantic States, particularly North Carolina, dominate nonupholstered wood furniture manufacture. Only California outranks North Carolina in terms of number of establishments and number of establishments with 20 or more employees. In all other respects, North Carolina is the most important nonupholstered wood furniture manufacturing state in the nation. In order of importance, the other areas are the North Central Region (Indiana the most important), Middle Atlantic States (New York), Far Western States (California), and East South Central States (Tennessee).

The South Atlantic States also dominate in the manufacture of upholstered furniture, with North Carolina again the dominant state. The North Central Region is second in importance, with Illinois the most important state. The Far West, Middle Atlantic, and East Central States rank next in importance.

The North Central Region, closely followed by the Middle Atlantic States, is the most important area in the manufacture of wood office furniture. This industry is smaller than either the nonupholstered, upholstered, or the public building furniture industries as measured by any of the criteria used here. In the North Central Region, wood office furniture manufacture is concentrated in Indiana and Michigan. In order of importance, the other areas are the Middle Atlantic States, the South Atlantic and East South Central States combined, and the Far Western States.

Public building furniture manufacture is concentrated in the North Central Region, with over one-third of all furniture plants and employees, and over one-half of all payrolls, value added in manufacture, and value of shipments. Michigan is by far the most important state, followed by Wisconsin. The other areas, in order of importance are the Far West, the South Atlantic, Middle Atlantic, and East South Central. Data for the four SIC categories in the North Central Region are given in Table 3.

Factors influencing the location of furniture-manufacturing plants have been explored by a number of economists. The furniture industry is market oriented, but labor, raw materials, and other factors also are important. To demonstrate the market orientation quantitatively, the ranking of the more important furniture-manufacturing states, based on value added in manufacture, number of establishments, or some other measure, is compared with the population ranking of these same states. Rank correlation coefficients depend on the measure of

Table 3.—Importance of Wood Furniture Manufacture in the North Central Region (U.S. Bureau of the Census), 1963

	No. of estab- lish- ments	No. of estab- lishments with 20 or more em- ployees	No. of em- ploy- ees	Pay- roll	Value added by manu- facture	Value of ship- ments
<i>Thousands of dollars</i>						
SIC 2511						
Illinois.....	138	46	4,791	21,308	30,955	60,920
Indiana.....	111	78	11,441	49,922	83,881	160,099
Iowa.....	16	5	397	2,038	3,577	7,184
Michigan.....	113	45	4,577	20,679	33,419	56,272
Minnesota.....	48	6	741	2,851	4,448	7,945
Missouri.....	38	12	768	2,916	5,461	11,510
Ohio.....	72	19	1,836	8,330	15,229	27,058
Wisconsin.....	57	19	2,474	10,356	16,656	29,888
Others.....	22	1	84	320	538	1,048
Total.....	615	231	27,109	118,720	194,164	361,924
U.S. total.....	3,063	992	140,982	574,614	993,200	1,857,992
Percent of U.S. total	20	23	19	20	19	20
SIC 2512						
Illinois.....	64	28	3,022	14,998	27,423	49,577
Indiana.....	48	27	2,941	12,719	20,456	38,552
Iowa.....	12	4	588	3,113	4,892	10,071
Michigan.....	63	26	2,120	10,277	19,050	35,175
Minnesota.....	13	5	287	1,498	2,121	4,271
Missouri.....	29	11	682	2,772	4,626	9,497
Ohio.....	57	17	1,884	9,772	16,530	30,467
Wisconsin.....	17	5	894	4,275	7,401	13,848
Others.....	15	6	482	2,449	4,241	7,508
Total.....	318	129	12,860	61,873	106,740	198,966
U.S. total.....	1,785	713	67,850	291,587	506,727	983,204
Percent of U.S. total	18	18	19	21	21	20
SIC 2521						
Indiana.....	10	10	1,139	5,251	9,325	16,555
Michigan.....	6	3	533	2,807	5,011	7,881
Others.....	10	4	616	3,187	5,918	10,381
Total.....	26	17	2,288	11,245	20,254	34,817
U.S. total.....	138	58	6,516	30,560	57,018	101,514
Percent of U.S. total	19	29	35	37	36	34
SIC 2531						
Illinois.....	29	13	972	5,020	9,624	17,319
Indiana.....	16	5	551	2,740	5,655	10,688
Iowa.....	5	4	184	952	1,997	3,664
Michigan.....	28	13	3,405	20,516	37,933	72,410
Minnesota.....	8	4	241	1,295	2,141	3,709
Ohio.....	30	10	772	3,914	5,893	10,396
Wisconsin.....	23	12	1,521	8,069	14,256	24,811
Others.....	13	4	197	964	1,709	2,922
Total.....	152	65	7,843	43,470	79,208	145,919
U.S. total.....	430	165	17,317	85,702	147,253	282,661
Percent of U.S. total	35	39	45	51	53	51
Totals						
NCR total.....	1,111	424	50,100	235,308	400,366	741,626
U.S. total.....	5,416	1,928	232,665	982,463	1,704,198	3,225,371
Percent of U.S. total	21	22	21	23	23	23

Source: (10).

furniture-manufacture importance, number of states being compared, and whether all furniture or selected kinds of furniture manufacturing are used. Swanson and Jones (9) found that when all states were ranked according to both percentage share of population and percentage share of furniture-manufacturing employment, the rank correlation was very high (0.917). Separately, the degree of association was 0.790 for nonupholstered wood household furniture, 0.889 for upholstered wood household furniture, and 0.787 for wood office furniture.

Using population and value added in manufacture, the most important furniture-manufacturing states, exclusive of North Carolina, were compared by SIC category. The following rank correlation coefficients were determined:

SIC 2511 (nonupholstered wood household furniture), 36 states	0.67
SIC 2512 (upholstered wood household furniture), 27 states . . .	0.67
SIC 2531 (public building furniture), 17 states	0.66

The relationship between concentration of furniture manufacture and population is not always strong. Location of raw material inputs, lack of capital, and historical attachment to the community also may be important. North Carolina, for example, ranks first among the 37 most important states making nonupholstered wood household furniture, but only twelfth in population. Over the years, the manufacture of high-quality furniture has become concentrated here because the necessary raw materials were there and skilled labor migrated to this area. North Carolina is also close to the large Middle Atlantic and New England markets.

Hagenstein (3) and Wickman (16) demonstrated that availability of raw materials, as well as less tangible factors rooted in history and management preference, can be important in explaining the location of furniture-manufacturing plants. According to Hagenstein (3), the quality of furniture produced depends primarily on two factors—labor and wood. The costs of both are higher for higher-quality furniture than for low grades of furniture. Wood source is geographically broad because the variety of species used is broad. For example, cherry comes from Pennsylvania, walnut from Indiana, yellow poplar from the Appalachian area, gum from the Mississippi delta, and mahogany from Central America. Furthermore, the species used in furniture manufacture can be substituted one for the other over a relatively wide range. As a result, furniture manufacturers are not necessarily tied to a particular geographic wood source. Nevertheless, while the cost of lumber is not the most important locational factor in the northern Appalachian area, the cost of lumber and particleboard ranks second only to the cost of labor.

Hagenstein (3) found skilled labor to be the most important factor influencing the location of furniture-manufacturing plants. This fact, together with availability of markets, lends credence to the relationship between population and furniture-making concentration. Labor skilled in the manufacture of furniture, however, is not necessarily skilled in other kinds of manufacture, and it tends to concentrate where furniture-making is concentrated, whether or not population is concentrated there generally. As Hagenstein notes, "Some say the best location for a new plant is next to a competitor's plant, in order to attract some of his labor." (3, p. 24) Even though skills can be developed, the cost of obtaining skilled labor or training all labor may be prohibitive for firms moving into an area where there are no furniture plants, even if the population is large.

Wickman, in his study of furniture manufacturing in New England (16), found that once established, the small, family-owned firms which dominate the industry are not likely to relocate as long as positive profits are being earned. He concludes that the benefits associated with the original location and the desire to remain there more than offset the differences between some minimal acceptance level of profits and the maximum level possible in a more economically promising area for many firms. There is, consequently, good reason to believe that furniture manufacture is labor-market oriented, although this relationship is not a perfect one. While these factors tend to keep furniture-manufacturing plants in their present locations, recent developments in the South and on the West Coast may be exceptions.

MAJOR CHARACTERISTICS OF THE FURNITURE INDUSTRY

An examination of furniture making will be more fruitful if we have some understanding of the basic characteristics of the industry. Production responds to consumer demands for furniture and some of the problems in the furniture industry are determined by the inherent nature of furniture and consumer preference for it. The resulting difficulties are most apparent in the wood office and public building furniture industries where manufacture on a custom basis is common. In the wood household furniture industries (both upholstered and non-upholstered), the structural influences may be less direct, but just as important.

Functionally, furniture is a homogeneous product. Within narrow limits, for example, all chairs or all tables serve the same purposes. Furthermore, furniture is relatively expensive and durable, and unlike other consumer durables, such as automobiles or household appliances

where obsolescence is hastened by functional as well as appearance changes, furniture generally is used for long periods of time. However, this situation is now changing to a certain extent. The reasons for this are discussed on page 32.

Several important factors related to the production, marketing, and management policies of the furniture industry follow from these characteristics. Expenditures for furniture do not account for a large proportion of consumer purchases for all goods and services. Also, it is not easy for the industry to enlarge this proportion by product differentiation and promotion. Furniture manufacturers nevertheless try to enlarge their markets, not by changing the function of their products, but by continually changing styles — a form of product differentiation. The household furniture segments of the furniture industry are characterized by use of a wide variety of furniture styles brought about through different combinations of raw materials and designs.

Despite these attempts to emulate manufacturers of other types of merchandise, furniture makers have not been able to truly differentiate their products. Except for a few of the very largest furniture manufacturers, one firm's output is not readily preferred over another's in the eyes of the consumer. There is no real functional difference in furniture from year to year and the artistic values inherent in furniture are not very useful in sales promotion efforts. Consequently, it is not easy to stimulate a higher rate of furniture consumption. Because of the present makeup of the industry, only a few firms have had many opportunities for mass production. This situation will not change until the industry structure shifts toward larger firms.

The attempts of furniture manufacturers to differentiate their products by proliferation of furniture styles have influenced firm size, production processes, and marketing procedures. Numerous styles and frequent style changes are not conducive to manufacturing efficiency and economies of scale. Furniture requires much hand work, and the use of automated machines which lower unit production costs is not widespread. Furthermore, furniture makers find it difficult, if not uneconomic, to manufacture more than one kind of furniture in any particular plant. Thus tables are made by one plant or firm, upholstered chairs by another, etc. Even large firms making more than one kind of furniture make the different kinds of furniture in separate plants. Finally, the manufacture of case goods¹ and upholstered furniture in the same plant is rare because the processes and materials are too different.

¹Case goods includes nonupholstered dining room and bedroom furniture (not including mattresses and bedsprings).

Because economies of scale in furniture manufacturing are hard to achieve, firms tend to be small in size. Also, competition among many small producers is keen. No one manufacturer contributes a significant proportion of the total furniture output, and competitive forces strongly influence the pricing process.

Despite the relatively small size of many furniture-manufacturing plants, excess physical capacity is fairly common. The natural tendency is to utilize this excess capacity to lower unit production costs. The method usually employed is to increase the number of styles of the items manufactured. But this procedure makes automation or long production runs difficult. Thus costs are seldom lowered, and the process tends to be self-defeating. There is no easy solution to this problem, short of structural reorganization in both manufacturing and marketing.

Entry into the industry is still relatively easy because capital requirements are not large, particularly for small firms. By the same token, exit from the industry is also easy. Furniture making requires relatively few highly skilled workers. Except for a few key positions, much of the work can be done by semiskilled labor. Because entry and exit are relatively easy, the number of firms tends to vary, depending upon economic conditions. Established furniture manufacturers do not benefit as much as they might from rising furniture demand because any upward shift in furniture demand will usually be met with an expansion of production capacity, part of which will come from new firms. With falling demand, capacity is reduced by the exit of some firms from the industry. In this respect, the furniture industry resembles the lumber industry.

With large-scale economies in the industry precluded and true product differentiation difficult, it follows that aggressive and efficient marketing activities designed to expand markets and increase sales volume also have been limited. Only a few large firms in recent years have made deliberate attempts to establish some kind of differentiation through marketing of coordinated groups of furniture. In these cases the manufacturer will offer several kinds of furniture, such as coordinated living room or dining room pieces. A few firms are even manufacturing and marketing upholstered as well as case goods as coordinated room furniture. The objective of this practice is to establish a brand name.

The marketing and promotion of furniture also differ markedly from those of large manufacturers of other types of goods making truly differentiated products. For example, automobile makers distribute

their products on national markets through franchised dealers and sponsor the bulk of advertising and product promotion. In contrast, furniture manufacturers have delegated the selling job to salesmen who are independent operators paid on a commission basis. These salesmen are the primary contacts between the manufacturers and wholesale and retail furniture stores, the latter being the principal outlet for the product. Individual furniture manufacturers generally have limited access to large markets, and few firms sell on a national basis. Advertising is sponsored primarily by retailers.

Because styling is the only way to differentiate an otherwise non-differentiable product, retailers and salesmen naturally demand style changes. Salesmen tend to emphasize price (and price cutting) even more than style because this apparently is a more powerful inducement in getting orders. Unfortunately, manufacturers are in a poor position to counter this action because salesmen are their contacts to retailers. Salesmen build such strong positions with retail dealers that manufacturers are reluctant to cut commissions despite their dissatisfaction with the price policies of furniture salesmen.

STRUCTURE OF THE FURNITURE-MANUFACTURING INDUSTRY IN THE NORTH CENTRAL REGION

Number, Kind, and Location

In 1964, there were 1,106 firms that manufactured furniture products included in the SIC categories covered by this study. Table 4 shows that most of the firms (61 percent) in the Region were found in SIC 2511 (wood, nonupholstered). SIC 2512 (wood, upholstered) was represented by 238 firms, or 22 percent of the total. The North Central

Table 4. — Number of Furniture-Manufacturing Firms
in the North Central Region by SIC Category in 1964

	SIC 2511		SIC 2512		SIC 2521		SIC 2531		Total firms
	No. of firms	Per- cent	No. of firms	Per- cent	No. of firms	Per- cent	No. of firms	Per- cent	
Firms making furniture in more than one SIC category..	85	8	53	5	105	9	109	10	352
Firms in which the product in the SIC category is the most important product.....	677	61	238	22	50	4	141	13	1,106

Region ranks highest nationally in the manufacture of wood office (SIC 2521) and public building (SIC 2531) furniture, although these industries are represented by fewer firms in the Region than either the case goods or upholstered furniture industries.

Table 5 shows how the firms are distributed over the states in this study by state and kind of furniture. Wisconsin has the most case goods manufacturers, followed by Illinois, Indiana, and Ohio; together these four states account for over 80 percent of all case goods manufacturers in the region. Michigan has the greatest number of upholstered furniture makers; Illinois, Wisconsin, Ohio, and Indiana are close behind. These five states account for over 75 percent of all firms in the region making wood upholstered furniture. Indiana leads in number of manufacturers of wood office furniture with 28 percent of all such firms in the North Central Region and Illinois and Ohio are also important in this field. These three states account for over 60 percent of all wood office furniture makers in the Region. Manufacturers of public building furniture are more evenly spread over the Region. Only Iowa and Indiana have relatively few such firms.

Size and Organization

Over 75 percent of all furniture-manufacturing firms in the North Central Region employed less than 50 persons in 1964 and over 40 percent employed less than 10. Thus furniture plants in the Region, like furniture plants elsewhere, tend to be small. Table 6 compares the number of firms by size class in 1959 and in 1964. The size-class pattern for furniture manufacturers in the North Central Region did not change materially during this period. There was some increase in the number of small firms relative to the larger ones. The preponderance

Table 5. — Distribution of Furniture-Manufacturing Firms in the North Central Region

State	SIC 2511		SIC 2512		SIC 2521		SIC 2531		All firms	
	No. of firms	Per cent	No. of firms	Per cent	No. of firms	per cent	No. of firms	Per cent	No. of firms	Per cent
Illinois.....	131	19.2	41	17.0	8	17.4	25	18.5	205	18.5
Indiana.....	122	17.9	31	12.8	13	28.3	6	4.4	172	15.6
Iowa.....	12	1.7	10	4.1	5	10.9	3	2.2	30	2.7
Michigan.....	54	7.9	46	19.0	3	6.5	21	15.6	124	11.2
Minnesota.....	23	3.4	16	6.6	2	4.3	22	16.3	63	5.7
Missouri.....	33	4.8	30	12.4	3	6.5	19	14.1	85	7.7
Ohio.....	105	15.4	33	13.6	8	17.4	20	14.8	166	15.0
Wisconsin.....	203	29.7	35	14.5	4	8.7	19	14.1	261	23.6
Total.....	683	100.0	242	100.0	46	100.0	135	100.0	1,106	100.0

Table 6. — Number of Full-time Employees in the
1,106 Furniture Plants in This Survey in 1959 and 1964

Number of employees	1959		1964	
	Number of firms	Percent	Number of firms	Percent
1 to 9.....	485	43.7	474	42.9
10 to 49.....	359	32.5	359	32.5
50 to 99.....	99	9.0	112	10.1
100 to 199.....	63	5.7	70	6.3
200 to 299.....	32	2.9	35	3.2
300 to 399.....	12	1.1	17	1.5
400 to 499.....	3	0.3	6	0.5
500 to 999.....	9	0.8	12	1.1
1,000 or more.....	2	0.2	3	0.3
Not available.....	42	3.8	18	1.6
Total.....	1,106	100.0	1,106	100.0

of small-size firms in SIC 2511 (wood, nonupholstered) is indicated in the following comparison:

	<u>SIC 2511</u>	<u>SIC 2512</u>	<u>SIC 2521</u>	<u>SIC 2531</u>
		<i>Percent</i>		
Firms in the Region				
with 19 or fewer employees....	75	51	46	50

Generally speaking, it is simpler to make the several kinds of case goods than it is to make the other furniture types. Case goods manufacture is carried on by a large number of small firms widely scattered over the region and one- and two-man shops are common. Wisconsin alone accounts for about 30 percent of all the small firms (19 or fewer employees) in the Region, and Wisconsin, Illinois, Ohio, and Indiana together account for almost 80 percent. As noted earlier, these same states also account for almost 80 percent of all case goods manufacturing firms in the Region. The greatest concentrations of larger firms (20 employees or more) are in Indiana (24 percent), Illinois (21 percent), and Michigan (21 percent). Both Indiana and Illinois are important in the manufacture of wood office furniture (SIC 2521), and firms in this category tend to be relatively larger.

The corporation is the dominant business form among furniture manufacturers of the North Central Region (Table 7). In recent years many small, single-owner firms have found it advantageous to incorporate so that personal liability may be reduced and capital-borrowing positions improved. Almost 40 percent of all small firms in the North Central Region are corporations, with only 50 percent still single proprietorships. As would be expected, almost all (95 percent) of large furniture-manufacturing firms are corporations. The corporate busi-

Table 7. — Type of Ownership by Furniture Manufacturers in the North Central Region in 1964

Type of ownership	Number of firms	Percent
Corporation.....	641	58.0
Single proprietorship.....	347	31.3
Nonincorporated partnership.....	105	9.5
Other.....	2	0.2
Not available.....	11	1.0
Total.....	1,106	100.0

ness form is more predominant in the upholstered, office, and public building furniture industries than in the case goods industry, primarily because of size of firm.

	SIC2511	SIC2512	SIC2521	SIC2531
		<i>Percent</i>		
Firms with 20 or more employees	25	49	54	50
Firms with corporate business forms	50	70	83	72

Multi-plant furniture-manufacturing firms are uncommon both nationally and in the Region. Over 90 percent of all furniture manufacturers covered in this study operated only one plant (Table 8). There are, of course, a few very large firms. The very high proportion of single-plant firms holds regardless of kind of furniture manufactured.

	SIC2511	SIC2512	SIC2521	SIC2531
		<i>Percent</i>		
Firms operating only one plant	91	90	89	88

Table 8. — Number of Plants Operated by Furniture Manufacturers in the North Central Region in 1964

Number of plants operated	Number of firms	Percent
1.....	1,001	90.4
2.....	56	5.1
3.....	5	0.5
4.....	10	0.9
5.....	7	0.6
6.....	1	0.1
7.....	0	0.0
8.....	1	0.1
9 or more.....	14	1.3
Not available.....	11	1.0
Total.....	1,106	100.0

Length of Time in Operation

Over 40 percent of all furniture-manufacturing firms participating in this study have been in business 20 years or more, and about 84 percent have been in business more than 10 years. Only 16 percent have been operating 10 years or less. On the basis of kind of furniture industry, however, the pattern is quite different.

	SIC2511	SIC2512	SIC2521	SIC2531
	<i>Percent</i>			
Firms 1 to 10 years old.....	26	17	2	19
Firms 11 to 20 years old.....	45	29	39	30
Firms more than 20 years old....	29	54	59	51

Apparently firms manufacturing upholstered, office, and public building furniture are not only larger and better organized, but they are older, on the average, than firms in the case goods industry. No data were collected on furniture firms entering or leaving the furniture-manufacturing business. However, of the 1,800 firms originally thought to make up the industry in the Region, only 1,106 were believed to be operative in 1964. A significant number of firms could not be located because many go out of business or move each year. Most of this instability apparently occurs in the case goods part of the industry.

Products

The bulk of furniture-manufacturing firms in the North Central Region produce household furniture, either case goods or upholstered, in a large variety of styles. As mentioned earlier, the proliferation of household furniture styles impedes efficient production. By the same token, style and price are the product characteristics upon which the industry depends most for sales promotion and market enlargement. Although styling is also important in the wood office and public furniture manufacturing sectors of the industry, it seems to receive much more attention in the case goods and upholstered household furniture sectors. To a certain degree, household furniture styles are carried over into office furniture.

The terms "style" and "design" are frequently used interchangeably both by the public and by furniture makers. However, the term "furniture design" refers to a set of furniture characteristics. When a set of furniture design characteristics identifies the work of a particular designer or school of designers, the set is termed a "furniture style."

Almost all of the furniture being made today can be identified as some variation of one or more furniture styles that have been developed over a period of time. In the case of modern furniture, style variations

are still being developed. Because the kinds and amounts of materials going into furniture manufacture are dependent upon furniture styling, it is desirable to briefly discuss the principal furniture styles used today. Later we will examine the factors which appear to govern furniture sales, including style trends and buyer characteristics. These, in turn, influence the use of wood and other materials used in furniture manufacture.

There are several ways to classify furniture styles, but one commonly used way divides furniture into three basic groups of styles. These are the traditional, provincial, and contemporary. Some styles are named for historical periods or European monarchs during whose reigns a particular furniture style became popular. Others bear the names of the furniture craftsmen who designed and made popular their own special styles of furniture. There are a few furniture companies that make true reproductions of traditional-style furniture. Usually these are high-quality, expensive pieces. More commonly, so-called traditional-style furniture pieces are modified versions of the earlier designs. Even at that, modified traditional furniture tends to be expensive. Some of the better-known traditional furniture styles are as follows.

Adam Brothers	Louis VI
Biedermeir	Louis XV
Chippendale	Queen Anne
French Renaissance	Regency
Hepplewhite	Sheraton
Italian Renaissance	Victorian
Jacobean	William and Mary

True provincial-style furniture developed by American colonial furniture makers after the severe styles of the Puritan or early colonial period were interpretations of the many traditional styles popular in England and France during the 18th and early 19th centuries. There were many modifications of the original European furniture styles. Some of the better-known provincial styles are as follows.

Duncan Phyfe	Italian Provincial
Federal	Pennsylvania Dutch
French Provincial	Shaker

Provincial furniture styles and adaptations also tend to be of relatively high quality and price. Although not nearly so ornate or ostentatious (especially the Pennsylvania Dutch and Shaker styles) as traditional-style furniture, provincial furniture can be of high quality. The

development of rockers, windsor chairs, Hitchcock chairs, and four-poster beds, among other pieces, is attributed to the so-called Late Colonial period in American history.

Traditional and provincial furniture styles are still very popular, particularly with upper- and upper middle-income families, and with older people. These styles are still made largely of fine hardwoods and require much handwork and skill. Neither traditional nor provincial furniture is necessarily purchased with comfort in mind. Traditional furniture in particular contributes importantly to the overall ornamentation of many homes.

Contemporary furniture is modern furniture, and it differs greatly in style, function, and choice of materials from either traditional or provincial furniture. Contemporary furniture is made in several distinct styles, and these and other styles are still in a process of development both in the United States and elsewhere. Some of the more popular contemporary furniture styles are:

Early American;

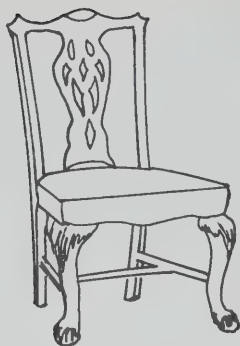
Modern:

Modern metal furniture;
Oriental modern furniture;
Ranch-style furniture;
Danish modern furniture;
Swedish modern furniture;
Shaker modern furniture.

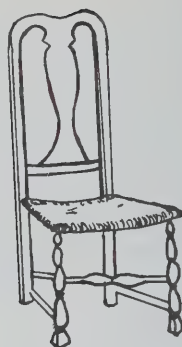
There are, in addition, several so-called ultramodern styles that make striking use of wood, metal, glass, plastics, and fabrics. Modern furniture styles are becoming more popular, possibly at the expense of the traditional and provincial styles. Furthermore, modern furniture styles are still very much in a state of flux, so the relative importance of the several kinds of raw materials involved in furniture manufacture is continually changing. Some trends are distinct, however, and these will be examined in more detail. Some examples of the more important furniture styles are illustrated on the next two pages.

Custom-Made Furniture

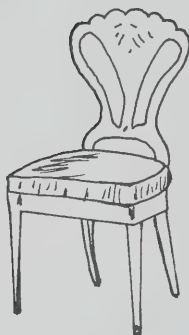
A very large number of furniture-making firms in the North Central Region make furniture to customer specifications. About 56 percent of all firms (624 firms) in the Region produce only custom-made furniture. If the firms whose business consists only partly of custom-made furniture are added, the total is 875 firms or about 79 percent. As



CHIPPENDALE



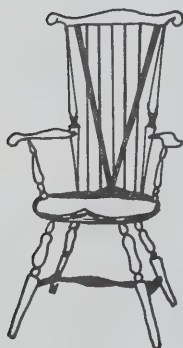
PENNSYLVANIA DUTCH



BIEDERMEIER



WILLIAM and MARY



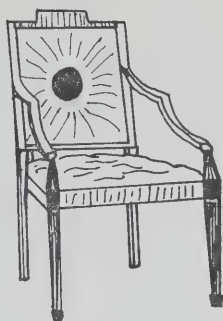
WINDSOR



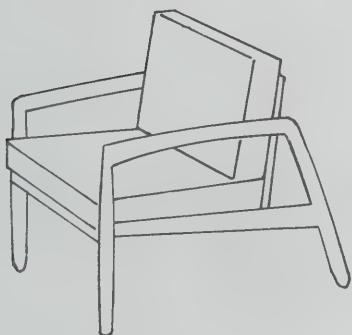
SHAKER



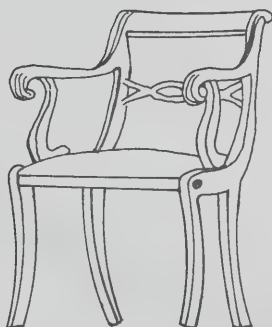
FRENCH 'PROVINCIAL



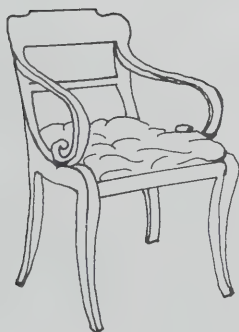
ADAM BROTHERS



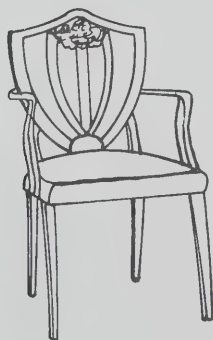
MODERN



DUNCAN PHYFE



ENGLISH REGENCY



HEPPLEWHITE

shown in the following tabulation, relatively more firms in the case goods and public building furniture-manufacturing sectors make only custom-made pieces. When the firms making just some custom-made furniture are added, there does not appear to be much difference among the sectors.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
		<i>Percent</i>		
Firms making only custom-made furniture.....	63	40	39	56
Firms making some custom-made furniture.....	17	34	43	26
Firms making no custom-made furniture.....	20	26	18	18

Small firms in all four sectors are much more involved in manufacturing to customer specifications than are the larger firms. The difference is very striking.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
		<i>Percent</i>		
Small firms making only custom-made furniture.....	78	55	55	72
Large firms making only custom-made furniture.....	30	26	4	38

Again, the greater importance of custom furniture manufacture in the case goods and public building furniture industries is noticeable, regardless of firm size. The reasons for this situation are fairly evident. For example, cabinets of all kinds, especially for the kitchen, and for housing radio and television sets, are made in great numbers by the case goods industry. Frequently, these must be made to exact order. Although some public furniture pieces like school desks and chairs, book shelves, and school tables can be made in quantity in some style or other, much other public building furniture like church pews, lecterns, theater equipment, display cases, and similar items must be built to customer requirements.

Non-custom-made furniture made for sale on the open market can vary greatly in quality. Although furniture makers participating in this study were not asked specific questions about the styles of non-custom-made furniture they manufactured, they were asked to classify their output by broad value classes. Over the Region as a whole, almost 60 percent of all firms reported they made medium-priced furniture (Table 9). Only 69 firms out of 482 (14.3 percent) said they made low-priced furniture. As one would expect, a relatively larger percentage of firms in the wood office and public building furniture industries make the high-priced furniture. Apparently there is no "low-

Table 9. — Number of Furniture-Manufacturing Firms Producing Various Quality Grades of Non-Custom-Made Furniture, as Measured by Price, in the North Central Region in 1964

Price	Number of firms	Percent
High priced.....	101	21.0
Medium priced.....	281	58.3
Low priced.....	69	14.3
Not available.....	31	6.4
Total.....	482	100.0

priced" office furniture being made in the Region, at least in view of the manufacturers.

	SIC 2511	SIC 2512	SIC 2521	SIC 2531
		<i>Percent</i>		
Firms making high-priced furniture.....	24	15	36	30
Firms making medium-priced furniture.....	57	68	64	64
Firms making low-priced furniture.....	19	17	0	6

OPERATION OF THE FURNITURE-MANUFACTURING INDUSTRY IN THE NORTH CENTRAL REGION

Marketing

Furniture-Buying Agents. The structure of the furniture-manufacturing industry in the North Central Region is further indicated by the gross sales data given in Table 10. Over one-third of all firms grossed less than \$100,000 in 1964, and the gross sales of 53 percent of the firms was less than \$500,000. As noted earlier, there are a small number of medium-size furniture-making firms in the Region. Some 27 of these grossed 5 million dollars or more in 1964. Twenty-nine firms were unable to estimate their gross sales at all, and 94 would not reveal this type of information to the interviewers.

Over the Region as a whole, the sales of about 25 percent of all firms are captive. That is, these firms sell only to specific buyers, usually to particular specifications. Frequently these firms are the manufacturing satellites of large radio, television, phonograph, or other electronics firms and produce cases and cabinets to very close tolerances for the parent firms. In other instances, cabinets and other furniture components are made under contract by independent furniture manufacturers. The proportion of firms with captive sales is much smaller

Table 10. — Gross Annual Sales of Furniture Manufacturers in the North Central Region in 1964 and Estimated Sales for 1969

Gross annual sales in dollars	1964		1969, estimated	
	Number of firms	Per- cent	Number of firms	Per- cent
Less than 100,000.....	401	36.3	255	23.1
100,000 to 499,999.....	295	25.6	223	20.2
500,000 to 999,999.....	74	6.7	98	8.9
1,000,000 to 1,999,999.....	101	9.1	80	7.2
2,000,000 to 2,999,999.....	43	3.9	61	5.5
3,000,000 to 3,999,999.....	25	2.3	41	3.7
4,000,000 to 4,999,999.....	17	1.5	18	1.6
5,000,000 to 5,999,999.....	9	0.8	21	1.9
6,000,000 and more.....	18	1.6	36	3.2
Do not know.....	29	2.6	172	15.6
Not available.....	94	8.5	101	9.1
Total.....	1,106	100.0	1,106	100.0

than the proportion who make only custom-made furniture (56 per cent), so most firms manufacturing furniture to order sell such furniture to more than one customer. The proportion of firms with captive sales does not seem to vary significantly over the several parts of the industry except for the wood office furniture sector.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Firms with captive sales.....	23	24	11	26

The most likely explanation for this is that wood office furniture makers, being larger corporate firms and fewer in number than other kinds of furniture manufacturers, are more frequently organized to handle both the manufacturing and marketing functions without outside help.

Furniture manufacturers sell to wholesalers, retailers, final consumers, manufacturers of other commodities, contractors, and other market agents. National data are not available for comparison, but in the North Central Region firms making sales exclusively to one kind of buyer were distributed as follows in 1964:

	<u>Whole- saler</u>	<u>Retailer</u>	<u>Final consumer</u>	<u>Manufac- turer</u>	<u>Contrac- tor</u>	<u>Other</u>
	<i>Percent</i>					
Firms selling exclusively to one kind of buyer	14	29	42	7	0	7

The practice of selling exclusively to one particular kind of buyer is most common in the upholstered, wood office, and public building furniture-manufacturing sectors. This practice appears to be least common among manufacturers of case goods.

	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>			
Firms selling exclusively to one kind of buyer.....	30	56	39	40

The principal type of buyer also varies, depending upon the kind of furniture sold, as shown below.

	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>			
Wholesalers.....	9	16	25	25
Retailers.....	16	45	46	8
Ultimate consumers.....	59	27	11	39
Manufacturers.....	9	7	4	6
Contractors.....	2	0	0	6
Others.....	5	5	14	16

Most case goods manufacturers sell to ultimate consumers because much of their output is custom made; the same is true of makers of public building furniture. Sale to retailers is favored by most firms making upholstered and wood office furniture. It will be recalled that these manufacturers produce significantly less custom-made furniture than do case goods and public building furniture makers. Under these circumstances, retail outlets become much more important. Furthermore, this buyer pattern does not seem to vary by size of firm within the several furniture-manufacturing sectors. Finally, it appears that sales to wholesalers, contractors, and manufacturers are becoming more predominant, while manufacturer sales to retailers and final consumers are becoming less so (Table 11).

**Table 11. — Changes in Principal Kinds
of Buyers of Furniture from 1959 to 1964
in the North Central Region**

Type of buyer	Sold more to in 1964	Sold less to in 1964
	<i>Number of firms</i>	
Wholesaler.....	53	25
Retailer.....	40	66
Final consumer.....	28	59
Manufacturer.....	8	4
Contractor.....	26	5
Other.....	20	17
Total.....	175	176

Several reasons were given for these shifts. Many household furniture manufacturers are taking advantage of the more efficient marketing procedures practiced by wholesalers. In contrast, a number of firms making public building furniture have shifted to dealing directly with universities, schools, and other customers primarily because of dissatisfaction with wholesaler and retailer performance. Some firms are taking advantage of sales through interior decorators, and a few firms have found catalogue-oriented retailers to be profitable customers.

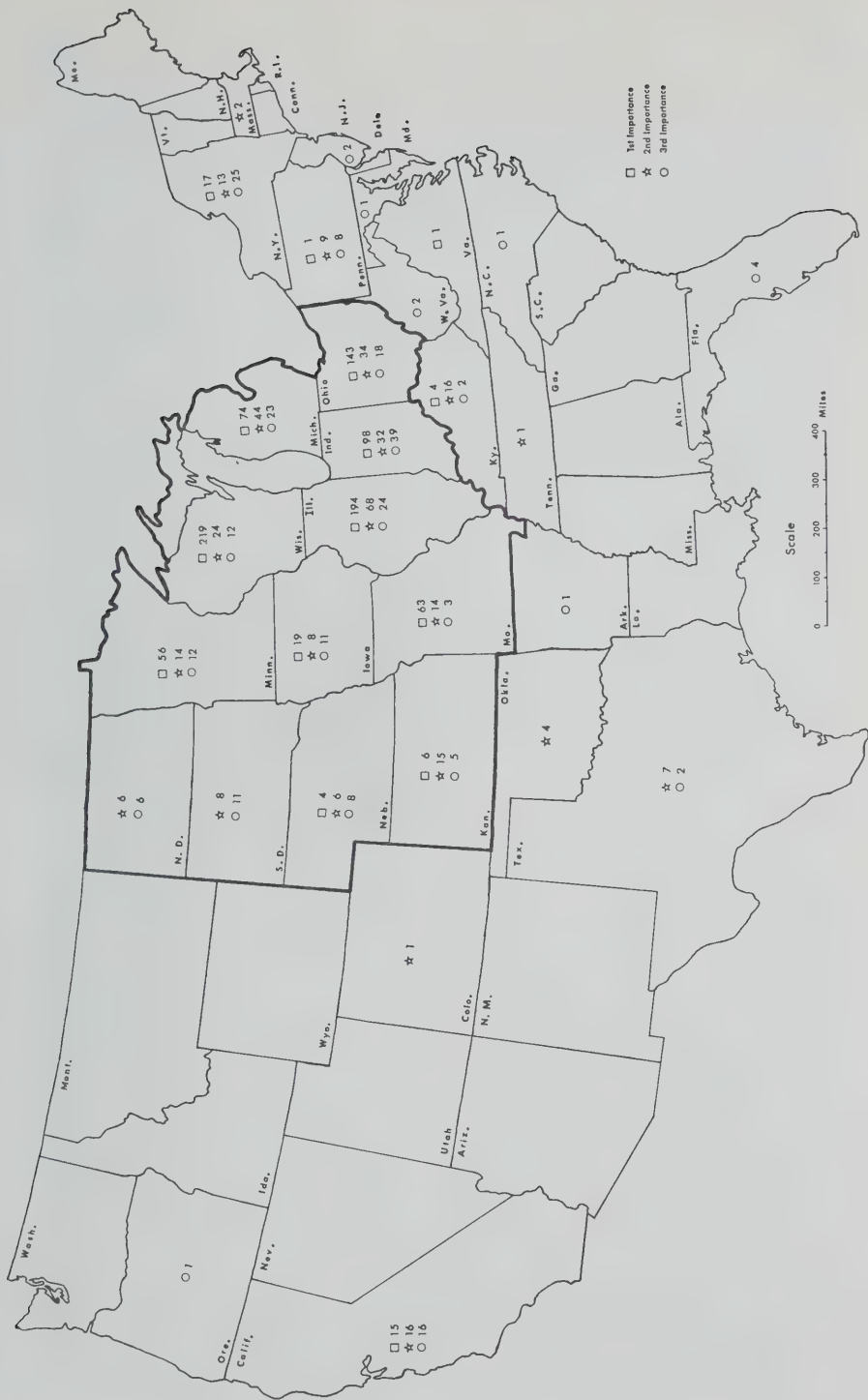
Location of Markets. From the geographical viewpoint, the North Central Region itself is the prime market area for furniture made in the several states composing the Region. However, states as far away as New York, Pennsylvania, and California represent important market areas for some firms in the North Central Region. The 15 most important states in which furniture made in the North Central Region was sold in 1964 ranked as follows:¹

- | | | |
|--------------|---------------|------------------|
| 1. Illinois | 6. Missouri | 11. Kansas |
| 2. Wisconsin | 7. Minnesota | 12. Kentucky |
| 3. Ohio | 8. New York | 13. Nebraska |
| 4. Indiana | 9. California | 14. Pennsylvania |
| 5. Michigan | 10. Iowa | 15. South Dakota |

The map on the facing page shows the geographic distribution of sales of furniture manufactured in the North Central Region. The numbers appearing within state lines represent the numbers of North Central firms that made sales in these states in 1964 of first, second, and third importance. Sales made in the more distant states most likely involve high-quality furniture or furniture (probably case goods) made for parent firms like electronics manufacturers, or furniture components made under contract to other manufacturers.

The Ultimate Consumer of Furniture. Despite the importance of captive furniture sales and the manufacture of furniture and furniture components to specific order of contractors, manufacturers, and others, the broad base for furniture sales is the public. The growth and stability of the furniture industry and the use of various raw materials used in making furniture ultimately depend on the size of the furniture market and on consumer preferences for the products this industry will produce.

¹ Firms were asked to name their first, second, and third most important state markets. The frequency of states named was multiplied by arbitrarily designated weights of 3 for the most important, 2 for the second most important, and 1 for the third most important. The results were then added. Rankings are based on these summed results.



Until quite recently, furniture manufacturers have been preoccupied with solving production and marketing problems resulting from the extreme competitive aspects of the industry. As one furniture-manufacturing executive put it recently, "This industry has always believed that there are only two ways to stimulate business. Bring out something new or cut prices." (7)

In recent years, however, a few of the large manufacturers of household furniture have devoted more effort to the study of the public's furniture-buying habits in an effort to reorient their operations. The results of these recent studies strongly suggest that major changes in consumer preferences and attitudes toward purchasing furniture are taking place. These changes portend a changing furniture-market structure and ultimately a different set of furniture styles and a different mix of raw materials used in furniture manufacture. Apparently, there are also in the offing some basic changes in the organization of the furniture industry that will not only affect the levels of productivity and costs in the industry, but will also modify the way furniture is presently marketed. These supply problems are discussed on page 41.

People buy furniture because they must have it in some form. There must be furniture on which to serve meals, sleep, sit, relax, and store the many items involved in everyday living. Within the budget constraint, the family's primary concern in house furnishings is to provide items appropriate to some chosen way of life.¹ People believe that their furniture reflects their personality, taste, and social status. The woman of the house traditionally assumes responsibility for furnishing the home. Many women believe that their reputations as homemakers rest in part on the general appearance of the home furnishings, especially the living room furniture. Motivation studies strongly suggest that women, and to a certain extent other family members, become emotionally attached to their home furnishings. This was perhaps true more so in earlier periods than now. It appears that only within the last 5 to 10 years have some of the traditional attitudes toward furniture begun to change.

The home-furnishings industries direct their promotional and styling efforts primarily to women. These efforts on the part of the furniture industry have met with only partial success for several reasons. The criteria for good taste in furniture are not well understood by consumers and perhaps cannot even be defined. Women shopping

¹ These remarks and much of the material that follows are based on a report published by the Kroehler Manufacturing Company (5). The report is based on a study conducted by Social Research, Inc., and financed by the Kroehler Manufacturing Company. Included in the material used is the classification of consumer furniture attitudes by social class level discussed later in this bulletin.

for furniture are frequently ill at ease because they are unsure about taste and are poorly informed as to furniture styles and quality. They usually are also constrained by budget limits. Many furniture shoppers are concerned about what relatives and friends will think of their furniture purchases. Furthermore, the custom of keeping furniture in the home for a long time (usually until it begins to fall apart) is well established. Furniture shoppers who have grown tired of their present furniture often feel guilty about its replacement because it is still serviceable.

The furniture industry itself has not done much to ease the consumer's dilemma. Lack of self-assurance in furniture buying is partly a result of unfamiliarity with brand names. Advertising is sponsored primarily by retailers who are more interested in promoting style and emphasizing price than developing brand-name allegiance. Proliferation of furniture styles and frequent style changes only add to consumer confusion and lack of assurance.

Furniture manufacturing and distribution are generally unrecognized major areas for fruitful financial investment. Great growth in the industry is possible in the opinion of researchers who have studied furniture-buying attitudes and of some investors and manufacturers outside the furniture industry. Before growth can occur, however, major changes in the structure of the industry will be required.

Social and Income Class Influences

Major growth in furniture manufacturing, other than that associated with population growth, probably will depend upon modernization of the industry. Other significant growth factors include changes in the social and economic structure of the buying public and the attitudes they hold with respect to furniture purchases.

Most of the feelings and anxieties that people associate with furniture are to be found at all social class levels; the differences are a matter of degree rather than kind. Yet, it is possible to delineate, at least broadly, some different attitude patterns according to social level. The attributes attaching to the several classes described below are believed to be held less strongly today than 10 years ago, but they are still held by a large proportion of persons in each class.

Briefly, the socioeconomic classes and their relative importance are:

	Percent of population	Percent of spendable consumer income
Upper class	1.5	5
Upper middle class	8.5	15
Lower middle class	25 to 30	25 to 30
Upper working class	40 to 45	40 to 45
Lower working class	20	5 to 10

Persons in the upper and upper middle classes include professionals like lawyers, doctors, some college professors, managerial and executive people, owners of prosperous businesses, and salaried people earning more than \$10,000 per year. Both men and women in these classes usually are college educated. Lower-level white-collar workers comprise the lower middle class. Included are sales clerks, bookkeepers, office managers, school teachers, small businessmen and contractors, and highly paid foremen. The upper working class includes mainly people in the blue-collar and service categories. The lower working class includes migrant farm workers, day laborers, poor tenant farmers, and some domestic and personal service employees. Generally speaking, people within each of these groups accept one another as social equals. They are apt to hold similar views, attitudes, and values; and they observe similar habits and customs.

According to the motivation study (5) from which the above data are drawn, the upper and upper middle classes (10 percent of the population) place most emphasis on tastefulness in furniture purchasing. Whether or not furniture and decor adequately represent financial and social status are important considerations. Shoppers from these classes are concerned with choosing definite furniture styles, and they are the principal buyers of antiques and traditional furniture, high-quality contemporary pieces, and designer-styled modern furniture. These classes usually can afford to indulge their preferences for furniture and do so, thus serving as furniture taste leaders. If new styles do not catch on with these groups, they usually do not attract purchasers from the other social levels.

Homemakers of the lower middle class are also usually quite conscious of furniture, even more so than upper middle class consumers. Even though they are more constrained financially than upper middle class women, homemakers in this class depend heavily upon furniture to establish their social reputations. It is said that they, more than either higher or lower status women, are apt to be "in the mood" to buy furniture. While upper middle class consumers are apt to know what they want in furniture and are concerned with expressing good taste regardless of the changes in fashion, consumers in the lower middle class are not so confident. This group is more conscious of furniture style trends than any other group. Furthermore, because consumers in this group cannot afford to buy furniture as often as the people in the upper group, they are interested in having the furniture pieces that they buy, retain their beauty for longer periods. Finally, because homemakers in the lower middle class often lack the financial means of buying the kind of furniture they would prefer, a large num-

ber are perpetually dissatisfied with what furniture they have. As such, this group offers the furniture industry a large and receptive market.

The upper working class, which makes up a large part of the population and accounts for a like share of disposable income, looks for comfort, ruggedness, and an up-to-date appearance in furniture. Beyond price, the most basic considerations of this group are the comfort and sturdiness of the piece. In addition to comfort and durability, homemakers in this group want furniture that can be kept clean easily. Women in this group find modern washable fabrics and coverings especially attractive. Finally, women in this class want their furniture to look up to date and feel that dated-looking furniture, even though more expensive-looking, speaks negatively of the family's financial status. Traditional or period furniture does not appeal to this group. Upper working class buyers prefer modern furniture, although not the more extreme designer-styled pieces. To this group, beauty in furniture tends to be equated with the newest things on the market.

Up to now the furniture industry has not paid much attention to differentiated marketing. Except for a relatively few larger firms, styling and marketing practices do not appear to be keyed to differences in consumers' preference patterns. The prevalent practice is to produce what is hoped will please the consumer, then wait to see what happens.

Frequency of Furniture Purchases. Population growth is an obvious factor affecting the growth of the furniture industry. Changes in the socioeconomic class structure of the furniture-buying public and class attitudes toward furniture are also important factors which could affect industry growth from the demand side of the market. There is at least one other major demand factor—the frequency of furniture purchases associated with the several life stages of the family—which appears to be undergoing modification.

During the early years of marriage, the couple must acquire sufficient furniture to satisfy basic living needs. Because budget limitations in most socioeconomic classes are more severe at this time than later, the price and sturdiness of furniture pieces are important considerations. This situation usually lasts through the first years of marriage when the couple begins to raise a family. Apparently young upper middle class families attempt to exhibit taste in furniture more frequently than lower class families, although their purchases may be limited to only one or two pieces of a particular style and quality in order to indicate the direction of future purchases.

New furniture is also quite often purchased when the children (particularly daughters) reach adolescence. In middle class families, there is the attempt to improve the appearance of the home and its furnishings to provide what the parents consider the proper appearance for young visitors. Among working class families, the change of furniture tends to be delayed until sons and daughters have reached adulthood and left home. At this time there is usually more money available and less likelihood that good furniture will be subject to damage by younger children. In general, both middle and working class families at this life stage tend to emphasize attractiveness and style rather than durability in their furniture purchases.

There are at least two other periods when it appears important to purchase furniture. New furniture is frequently purchased when families move into new homes either because of a change in economic status or relocation of residence for other reasons. Given the mobility of American families now and the expected increase in mobility, this factor looms as an increasingly important one. In like manner, the movement of families into higher socioeconomic classes is frequently accompanied by a refurnishing of the home. The continued upgrading of the economic position of the average American family is expected with increases in educational opportunities and industrial productivity. There may be major changes in furniture preferences in the offing, although at present the industry as a whole does not seem to be aware of this possibility.

Prospects for Change in Consumer Attitudes and Demand for Furniture. In 1963, the Kroehler Manufacturing Company sponsored a second consumer attitudes study.¹ The results indicated that some important changes in consumer preferences for furniture and long-established buying patterns were indeed taking place. The major forces responsible for the change in furniture-buying attitudes appear to be the increasing proportion of young people in the population, the increasing tempo of technological advancement in production and innovation of new consumer products, and the general rise of educational and income levels of the population. According to the second Kroehler study (6), the significant changes are:

1. Cultural changes are resulting in the more rapid movement of style acceptance from one socioeconomic group downward to the next; that is, the furniture market is tending toward more homogeneity.

¹ Much of the discussion on changing consumer attitudes toward furniture preferences and purchases is based on the second Kroehler report (6). The report is based on a study conducted for the Kroehler Manufacturing Company by the Institute for Motivational Research.

2. There appears to be more concern for the expression of one's individuality in relation to the home and its furnishings. Thus, there may be less concern about what others may think of the furniture purchases or the manner in which the home is decorated.

3. Consumers are showing more self-confidence in the planning and shopping for home furnishings.

4. A self-permissive attitude, made possible in part by increased economic freedom, is significantly changing traditional values regarding furniture (as well as other things).

5. Consumers are becoming much better informed about furniture style and quality. To a certain extent, there is a growing impatience with uninformed, overly aggressive retail personnel.

6. The older idea that furniture should last a long time does not appear to be as strongly held as it once was. The desire for change so prevalent in other areas of American life is also changing furniture value patterns.

7. In the past the woman of the house has been chiefly responsible for the choosing of furniture, but today the role of the husband is becoming more important.

The American scene is one of rapid change in many directions. Young people, especially those born during or shortly after World War II, married, and in the process of establishing families appear to be particularly moved by "change." While the pattern of saving and preserving is still strong among mature women, it is apparently diminishing among the younger purchasers of furniture. Another factor contributing to more rapid changeover of furniture is the attitude that the home should be lived in and that furniture should be used, not set aside for show. Finally, the annual styling changes in other consumer durables like automobiles, television sets, and refrigerators tend to condition the younger consumer to think in terms of replacement. Surprisingly, the desire for replacement of furniture after a reasonable period of use appears to be fairly strong across all the socioeconomic classes.

Americans are on the move, and this movement encourages the purchase of new furniture. Whereas a generation or more ago, it was common that a family become established in one house in one town or city, today families are apt to move frequently from one house to another one in the same or a different town. It is estimated that in 1962 about 35 million families moved. Some of these moves were related to job relocation, but a large proportion involved change in the family's socioeconomic standing. These moves tend to make furniture

obsolete; the new home usually calls for an upgrading in furniture styling and decor.

The first Kroehler study (5) indicated that except for people in the highest socioeconomic group, there were three periods in the family life cycle when a family was likely to make major furniture purchases. According to the second study (6), there are at least six times in the family cycle when the purchase of new furniture appears to be appropriate. These are:

1. When newlyweds furnish the first house or apartment.
2. When more furniture is needed to meet the needs of a growing family.
3. When important promotions occur and there is movement up the status ladder.
4. When teenagers reach the age of criticism and begin to bring friends home.
5. When the family moves or when it acquires a vacation cottage.
6. When the children leave home.

It is obvious that a continuation and acceleration of these trends will greatly affect the demand for furniture. Now, more than ever, the furniture industry will need to pay specific attention to consumer preferences and attitudes if it is to take advantage of a large potential market for its products.

Costs, Prices, and Operations

As noted earlier, the manufacture of many kinds of wood furniture has traditionally been mostly done by hand labor. It has been observed that for 200 years the furniture industry has managed to preserve the characteristics of its handcraft origin in a time when mass production for mass consumption is the rule for progressive manufacturing organizations (7). Most of the firms in the industry are still small in size, inbred in management, inefficient in production, and basically opposed to technological change. Costs of manufacture in the furniture industry tend to be high. Furniture manufacturing has been likened to the textile industry of about 20 years ago, before corporate structure, production, marketing, and management were modernized, principally through the infusion of outside investment and talent.

Although the present study does not delve deeply into furniture-manufacturing costs, some very general cost information for the North Central Region is available. It should be noted that the responses to the cost questions were most diverse, and the meaning of the data may be somewhat obscure. It is highly probable that many small firms had

no good records of their costs and thus supplied only guesses, if they answered at all. It is also possible that some respondents misunderstood the meanings of the different cost categories, further distorting the results. Even the responses from the larger firms, which have more complete cost records, were not uniform.

Several other factors contribute to the variation in cost components besides the kind of furniture being made. Materials costs tend to be higher and labor costs lower in the manufacture of lower-quality furniture. This situation is reversed where high-quality furniture is made. Where dimension stock and premanufactured parts instead of rough lumber are used, materials costs tend to be higher and labor costs lower. According to Wickman (16), the available furniture-manufacturing cost data, even though fragmentary, indicate that the national trend over the past 40 years has been toward lower labor costs, little change in materials costs, and some increase in factory overhead costs.

Some indication of the relative importance of the several kinds of costs of furniture manufacturing in the North Central Region is given below.

	<u>SIC 2511</u>	<u>SIC 2512</u>	<u>SIC 2521</u>	<u>SIC 2531</u>
	<i>Percent</i>			
Direct labor.....	20 to 39	20 to 39	20 to 39	20 to 39
Wood materials	20 to 39	10 to 19	20 to 39	20 to 39
Other materials	10 to 19	20 to 39	10 to 39	10 to 39
Factory overhead.....	1 to 19	1 to 19	1 to 19	10 to 19
Selling and administration.....	1 to 19	1 to 19	1 to 19	10 to 19
Transportation	1 to 9	1 to 9	1 to 9	1 to 9
Miscellaneous	1 to 9	1 to 9	1 to 9	1 to 9

Direct labor charges appear to comprise 20 to less than 40 percent of total manufacturing costs for most firms regardless of SIC category. However direct labor costs were reported to be greater by many small firms in the case goods sector of the industry (20 to 39 percent). Wood materials costs were about the same as direct labor charges except for firms making upholstered furniture. Here, wood materials costs were reported to run only 10 to 19 percent of all costs, while other materials (principally fabrics, cording, springs, webbing, etc.) costs ran 20 to 39 percent. Other materials costs were much more variable for manufacturers of wood office and public building furniture (10 to 39 percent) but were only 10 to 19 percent for case goods manufacturers.

Cost of factory overhead was lower in the case goods and upholstered furniture sectors of the industry than in the wood office and public building furniture sectors. Furthermore, small firms in the case goods sector had lower overhead costs (1 to 19 percent) than did the

larger firms (10 to 19 percent). Factory overhead costs covered a wide range of 10 to 39 percent in the wood office and public building furniture sectors, and this range did not appear to vary between large and small firms in either sector.

The costs shown in the above tabulation also lie within the ranges of values computed by Wickman (16) for furniture manufacturers in New England. In his study direct labor charges were reported to comprise 10 to 40 percent of total costs, with most firms reporting 20 to 40 percent. Materials costs comprised 20 to 60 percent, with most firms reporting 20 to 40 percent. Factory overhead costs ran 10 to 20 percent, selling and administration costs 1 to 20 percent, and transportation costs 1 to 10 percent. In many respects the history, organization, and operation of the furniture industry in the North Central Region and in New England are similar.

Wood materials costs are a significant proportion of total manufacturing costs in all but the upholstered furniture sector of the industry in the North Central Region. The relative importance of the several kinds of wood materials in terms of proportion of total wood raw materials costs is shown in the following tabulation.

	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>			
Lumber.....	20 to 39	80 to 99	20 to 39	20 to 39
Hardwood plywood.....	20 to 59	1 to 19	40 to 59	20 to 39
Softwood plywood.....	20 to 39	1 to 9	10 to 19	10 to 39
Veneer	10 to 39	1 to 19	1 to 9	10 to 39
Particleboard	1 to 19	1 to 9	10 to 19	1 to 9
Fiberboard.....	1 to 9	1 to 9	1 to 9	1 to 9
Other wood.....	1 to 9	1 to 9	1 to 9	1 to 9

In interpreting these data, it should be pointed out that cost proportions for some wood materials such as veneer and especially particleboard, fiberboard, and other wood materials are based on fewer responses than are the estimated cost proportions for lumber or the plywoods. Depending upon the kind and quality of the furniture being made, some of the materials are not used at all, and hence only a few firms who use some of a particular material may make up the total response.

Based on total wood materials cost, lumber is used heavily in all kinds of furniture. In the manufacture of upholstered furniture, lumber, the only important wood material used, accounts for 80 to 99 percent of all wood raw materials cost. Except in upholstered furniture, the cost of hardwood plywood appears to be as important or more

important than the cost of lumber in the manufacture of most furniture; softwood plywood is relatively less important. Hardwood plywood is particularly important in the manufacture of wood office furniture, where its cost may account from 40 to 59 percent of the cost of all wood materials used.

As indicated by the data, the cost of veneer can be important in the case goods and public building furniture sectors. There are still many firms making high-quality tables, buffets, bedroom furniture, and other special pieces which do inlay veneering for special artistic effects. Particleboard, fiberboard, and other wood materials costs usually run less than 10 percent of wood materials costs.

Because manufacturers, especially those operating within highly competitive industries, are reluctant to give out much cost or price information, particularly the latter, only one pricing question was asked in this study. Companies were asked to describe, in general terms, how the prices are established for the products made by them. There was considerable variation in the responses, but in general most firms stated that they set prices by adding a profit margin to the cost of making the item (cost plus profit). Few firms were willing to divulge how the profit margin was determined.

Most firms interviewed displayed marked sensitivity to the highly competitive market conditions existing within all sectors of the industry. It appears that, except for the highest-quality furniture, workable competition exists in all sectors of the industry, and sometimes perfect competition appears to be approximated. Thus competitive forces appear to strongly influence the setting of a firm's profit ratio, even though a cost-plus-profit system of pricing is used. For furniture manufacturers selling mainly through independent sales agents, there is additional pressure to cut prices because salesmen tend to emphasize price and style, and because they occupy a most important position in the furniture-distribution system.

With some notable exceptions, furniture manufacturing and marketing operations are archaic and, to a considerable degree, chaotic when compared to similar operations in other industries. The furniture industry in the North Central Region is no exception. Costs and prices in the furniture industry are partly a reflection of the way the industry operates. Furthermore, future growth of this industry and hence of materials use will also be determined in part by what changes are made in operations.

Considering the highly competitive character of furniture manufacturing and the associated structural handicaps under which the industry operates, its performance in terms of earned rates of return

over the years has been at least respectable. Of course, representative rates of return on sales or investment are difficult to obtain at best, and they vary by point in time and geographical location. On the average, however, it appears that over the past 35 years the furniture-manufacturing industry has earned profits of about 3 to 4 percent on sales and 8 to 10 percent on investment (2, p. 27). This performance has been possible because there has been an underlying growth in demand for furniture, not because of proficient financing, management, or production. Apparently this moderate growth is viewed as satisfactory by most of the industry. Indeed, many firms expect the industry to grow and prosper without the need for major changes in operations. Some of the optimistic growth outlook in the North Central Region is shown in Table 10 on page 24. More firms expect larger gross sales (and presumably larger profits) in 1969 than they had in 1964. Such expectations are not without foundation. However, the magnitude of the potential growth of sales and profits that would follow modernization of furniture-manufacturing operations probably has been badly underestimated by the furniture-manufacturing industry in the North Central Region and elsewhere.

Furniture manufacturers in the Region and probably in other areas also believe that growth will be limited not only by market factors, but by lack of trained labor, the growth of unionism and increasing wages, competition with southern furniture manufacturers who operate with more modern plants and equipment and with cheaper labor, and by the difficulty small firms have in financing modernization of plants or equipment.

Table 12 indicates that over 41 percent of all firms in the North Central Region could have expanded output in 1964 with the plant and equipment on hand. According to the data below, there was excess capacity in all the furniture sectors in 1964. This excess capacity probably still exists.

	SIC 2511		SIC 2512		SIC 2521		SIC 2531	
	Small firms	Large firms	Small firms	Large firms	Small firms	Large firms	Small firms	Large firms
	<i>Percent</i>							
Firms with no excess capacity . . .	51	45	39	34	57	54	40	46

Manufacturers of upholstered furniture reported the largest potential for increased output with existing facilities. Furthermore, except for makers of public building furniture, the larger firms have more excess capacity than the small ones.

**Table 12. — Estimated Possible Output Increases
With Existing Production Facilities by Furniture
Manufacturers in the North Central Region in 1964**

Estimated possible increase (percent)	Number of firms	Percent
None.....	645	58.3
1 to 9.....	21	1.9
10 to 19.....	94	8.5
20 to 29.....	144	13.0
30 to 39.....	45	4.1
40 to 59.....	92	8.3
60 to 69.....	11	1.0
70 to 79.....	14	1.3
80 to 89.....	1	0.1
90 to 99.....	0	0.0
Not available.....	39	3.5
Total.....	1,106	100.0

Objective observers of furniture operations outside the industry are far from convinced that the magnitude of expected growth held by industry operators is entirely justified. No doubt some growth will occur. The major expansion which could occur, however, will not unless significant operational changes are forthcoming.

Mechanization, if not automation, in furniture manufacturing is not as widespread as it might be, even given the product characteristics. Small firms, tight control, family-oriented management, and proliferation of furniture styles work against long production runs of any one model. A few of the larger furniture manufacturers, especially in newer plants located in the South and West, are making greater use of semi-automatic and automatic equipment. Attempts by the more progressive firms in the industry to bring out attractive lower-cost pieces, often at high design cost, are limited because numerous smaller firms soon copy the new designs and proceed to undercut prices. As elsewhere, there are a few large firms in the North Central Region conducting product and design research and a number of firms have design groups. Design and product-development functions are carried out in separate departments of large firms. A few small firms also contribute new products and designs, although the process may be less formalized.

In part, refusal to mechanize furniture making where lower costs are expected is rooted in an old argument, supported by pride and tradition — that furniture manufacture is practically an art and that the manufacture of truly good furniture cannot be automated. This argu-

ment is bolstered by the poor quality of much low-cost furniture made by some firms who have automated their operations.¹

Some companies have instituted quality-control programs, but their number is small. In the North Central Region, only 295 firms (26.7 percent) of the 1,106 firms in the industry stated they had some provision for quality control. The following tabulation shows how provision for quality control varies over the several furniture sectors.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Firms with quality control.....	25	32	43	28

Manufacturers of upholstered furniture and wood office furniture appear to be more conscious of quality control, at least in terms of their interview responses, than other furniture makers. Larger firms had provision for some kind of quality control more often than did the small firms with the exception of wood office furniture where size of firm did not seem to matter.

Quality control may consist more of an inspection of the final products for obvious flaws than of close control over the manufacturing process. For example, only 34 firms (3.1 percent) of the 1,106 firms in the Region stated that they employed a wood technologist to handle the technical problems connected with the use and finishing of wood materials. Wood technologists are more frequently employed in the wood office and public building furniture sectors than in the others, but nowhere are they to be found in large numbers.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Firms employing a wood technologist	2	2	7	8

Further indications of general complacency within the North Central Region furniture-manufacturing industry are manufacturers' plans for the future employment of wood technologists and conduct of marketing research to better forecast consumer preferences. Of the 1,106 firms contacted, 67 (6.1 percent) stated they planned to hire

¹ According to O'Hanlon (7), the National Retail Merchants Association decided to write a set of furniture-manufacturing standards so basic as to actually border on the ludicrous. For example: "All screws must be turned in and not hammered in." "Pieces should be steady and free from wobble in normal use." "Color or shading should be uniform and consistent." Yet this listing of obvious qualifications for retailer and consumer protection has received little sympathy and attention from furniture manufacturers. Because much of the production from Southern plants (and presumably elsewhere) is lower-quality furniture, manufacturers argue that strict quality control would seriously lower profit margins.

wood technologists in the future. Although this represents some improvement over the present situation, the industry still has a long way to go if it is to give serious attention to quality control in manufacturing.

Only a few firms in the Region have conducted marketing research in an effort to determine consumer acceptance of their products. As mentioned earlier, a few large firms (at least one in the North Central Region) have contracted for outside consultation or for the conduct of complete consumer and marketing studies. So far as the future is concerned, 163 firms (about 15 percent) in the Region said they plan to do marketing research in the future. A few firms stated that their future plans to do marketing research would depend upon "economic conditions." As noted in the following tabulation, more manufacturers of wood office furniture are planning to do marketing research than are the makers of other kinds of furniture.

	<u>SIC 2511</u>	<u>SIC 2512</u>	<u>SIC 2521</u>	<u>SIC 2531</u>
	<i>Percent</i>			
Firms planning to do marketing research	13	14	31	21
Firms not planning to do marketing research	80	72	57	62
Firms planning to do marketing research if conditions permit...	7	14	12	17

Many people inside as well as outside the furniture industry believe that it is not fully using its resources and that changes are overdue. The direction of the changes that are in the making is indicated by the structure and operations of some of the more recent industry entrants. As was the case in the textile industry some 20 years ago, "the much needed transfusion of capital, professional management and national marketing is coming from outside." (7) Modernization appears to be moving in several directions. A number of major corporations are acquiring furniture plants and, further, are adding carpet, textile, and home furnishings accessories manufacturing establishments to make possible for the first time the marketing of coordinated home furnishings "packages" under national brand names. Because of increased operations problems, the new firms are employing professional management personnel, streamlining and automating manufacturing processes wherever possible, and modernizing production and raw materials supply schedules, sometimes through the use of computers.

With greater resources at their disposal, some new firms are placing much greater emphasis on consumer service. Retailers and department stores have long advocated coordinated design and color in furniture, fabrics, carpets, and accessories. Increasingly, progressive furniture makers and sales outlets are displaying whole rooms, coordinated in

design and color, and in this way are making home furnishing a less frustrating and worrisome job for the consumer.

Increasing labor and transportation costs are forcing some firms to modernize their distribution systems. The larger, newer entrants to the industry, with more plants and centrally located distribution centers, are able to relieve retailers and wholesalers of inventory burdens, and to deliver ordered merchandise in a week or two instead of six weeks or longer. One new firm which recently introduced regional distribution centers offers its dealers delivery of over 1,000 items of office furniture within 48 hours of receipt of the order (7).

Some of the newer furniture manufacturers are even experimenting with designs and materials heretofore not used in furniture making. For example, at least one manufacturer believes there is no good reason why furniture cannot be made entirely from high-density plastic and advertised as such. The idea, of course, is that prices could be greatly lowered and styles that are not possible in wood could be molded by automated equipment (7). Whether such drastic styling and materials use ever becomes important will depend upon consumer acceptance, but the move is indicative of the new thinking in an old and conservatively operated industry.

According to the data presented by O'Hanlon (7), population in 1975 may be increased by 30 million over 1967, the number of households will have risen by 20 percent, and about 40 percent of all families will have incomes of \$10,000 or more per year. The increasing tempo of furniture sales will probably be accompanied by more consolidation and innovation in the industry.

USE OF WOOD RAW MATERIALS

Table 1 (page 5) shows the importance of wood raw materials used in furniture manufacture compared to the use of wood raw materials in manufacturing generally. In 1965, furniture manufacture accounted for about 21 percent of all lumber used in manufactured products, 29 percent of all veneer, 33 percent of all plywood, 32 percent of all hardboard, and 60 percent of all particleboard. Table 1 also shows that the four furniture categories covered in this study accounted for 90 percent of the lumber, 97 percent of the veneer, 77 percent of the plywood, 78 percent of the hardboard, and 65 percent of the particleboard used.

Some wood-use data are available on a Regional basis for 1960 (11). Table 13 shows that the North Central Region and Kentucky accounted for about 25 percent of all lumber, plywood, and particleboard and 22

Table 13.—Regional Wood Use in Furniture Manufacturing in SIC Categories 2511, 2512, 2521, and 2531 in 1960

USDA Forest Service Region	Lumber	Per- cent	Plywood ^a	Per- cent	Veneer ^b	Per- cent	Hard- board ^c	Per- cent	Partic- le- board	Per- cent
	Million board feet		Million square feet, 3/8-inch basis		Million square feet, 1-inch basis		Million square feet, 1/8-inch basis		Million square feet, 3/4-inch basis	
Central ^d	415.2	25	124.9	25	8.8	22	52.7	25	11.6	26
Pacific.....	165.4	10	66.7	14	3.1	8	21.8	11	4.4	10
Rocky Mountain.....	10.9	1	5.4	1	0.2 ^e	1	1.1	1	0.3 ^f	1
Northeast.....	333.5	20	123.7	25	4.7	12	43.7	21	7.5	17
South.....	737.6	44	171.8	35	23.0	57	88.0	42	21.3	46
Total.....	1,662.6	100	492.5	100	39.8	100	207.3	100	45.1	100

^a Does not include SIC 2521.^b Does not include SIC 2512.^c Does not include SIC 2512 and SIC 2521.^d Including Kentucky.^e SIC 2531 only. All others are less than 50,000 square feet each.^f SIC 2511 and SIC 2531 only. All others are less than 50,000 square feet each.

Source: (17).

percent of all hardboard used in the manufacture of the four types of furniture covered in this study. The Region ranked next in importance to the Southern States in the use of each of these materials.

The decision regarding the kinds of wood materials to be used in furniture manufacture is generally made at a high level in the firm. In small firms, the owner-manager makes this decision as well as most of the other decisions that must be made in running the business. In large firms the president, vice-president, or a similar official is usually in charge of wood and other raw-materials purchasing. In some cases research and development or design and engineering departments have control over such decisions. In firms that produce to specifications (captive firms or firms doing custom work), wood-purchase decisions are controlled externally.

Over 88 percent (979 firms) of all furniture plants in the North Central Region purchased hardwood lumber in 1964, and 54 percent (600 firms) purchased softwood lumber. Obviously, some firms bought both kinds of lumber, and a substantial number (495) used no lumber at all. Over 500 firms purchased their hardwood lumber in rough form (Table 14). On the other hand, most firms purchased softwood lumber in the finished form. This purchase pattern results primarily from the way each kind of lumber is manufactured and sold. Softwood lumber is surfaced and visually graded for use in the board form. Hardwood lumber is meant to be cut and finished to fit a wide variety of needs and is usually sold in the rough board form unless ordered surfaced. About 12 percent of the firms bought softwood dimension stock and about 20 percent purchased hardwood dimension stock.¹

The form in which lumber is most often purchased varies by the kind of furniture being manufactured. The following tabulation shows, by percent of firms in each SIC category, the form in which softwood lumber was purchased in 1964:

	SIC2511	SIC2512	SIC2521	SIC2531
	<i>Percent</i>			
Dimension stock	23	13	55	32
Rough lumber	23	56	32	40
Finished lumber	54	31	13	28

¹ Softwood dimension stock is lumber at least 2 inches and less than 5 inches thick, and 2 or more inches wide. Hardwood dimension stock is graded under the specifications of Commercial Standard CS60-48, Hardwood Dimension Lumber, as lumber "... normally kiln-dried, which has been processed to a point where the maximum waste is left at the dimension mill, and the maximum quality delivered to the user." Hardwood dimension may consist of rough planks cross-cut and ripped to a particular size, surfaced lumber of specific size, glued or laminated pieces, or fabricated and finished wood processed to a point where it is ready for assembly. (From (1), pp. 248 and 259.)

Table 14. — Form of Lumber Purchased by Furniture Manufacturers in the North Central Region in 1964

	Softwood lumber		Hardwood lumber	
	Number of firms	Percent	Number of firms	Percent
Dimension stock.....	137	12.4	214	19.3
Rough boards.....	168	15.2	501	45.3
Finished boards.....	295	26.7	264	23.9
Total firms purchasing lumber.....	600	54.3	979	88.5
Firms purchasing no lumber..	495	44.7	119	10.8
Do not know.....	4	0.4	8	0.7
Not available.....	7	0.6	0	0.0
Total.....	1,106	100.0	1,106	100.0

Softwood lumber in the form of dimension stock was purchased by over half of all firms manufacturing wood office furniture and by about a third of all public building furniture makers. Rough softwood lumber was purchased by most manufacturers of upholstered furniture. Much of this material is used for frames and other components not visible in the finished piece. Many wood office and public building furniture makers also purchased their softwood lumber in rough form, preferring to do the final surfacing and cut-up work on their own machines. Most softwood lumber used in case goods manufacture is surfaced.

The purchase pattern for hardwood lumber differs from that for softwood lumber:

	SIC2511	SIC2512	SIC2521	SIC2531
	<i>Percent</i>			
Dimension stock	25	22	7	15
Rough lumber	45	54	78	68
Finished lumber	30	24	15	17

The fact that hardwood lumber is sold in rough form to most firms and further processed in the furniture plant is immediately evident in the above data. Rough hardwood as well as softwood lumber is used in the manufacture of upholstered furniture. This accounts for the high percentage of firms in SIC 2512 using rough hardwood. Almost 80 percent of wood office furniture and 70 percent of public building furniture manufacturers also purchased rough hardwood lumber.

About six times as much hardwood as softwood lumber is used in the manufacture of furniture.¹ Although data are not available, it is also likely that much more hardwood dimension stock is used than softwood dimension stock. Hardwood lumber traditionally has been

¹ Based on 1960 figures.

sold in the rough board form, and furniture plants have done most of their own surfacing and cutting. Consequently, the proportion of total hardwood lumber purchased as dimension lumber is smaller than in the case of softwood lumber. Because the demand for hardwood dimension stock by furniture manufacturers has been low, hardwood lumber mills have not produced this kind of material in volume.

Some progressive furniture manufacturers are presently using dimension stock wherever possible in order to effect savings in labor and wood costs. In the North Central Region, the purchase of dimension stock is much more common in the larger furniture plants than in the smaller ones. As the pressure to cut costs increases, more hardwood dimension stock will be demanded and lumber mills will produce more highly processed lumber. In most sawmills of the North Central Region, such a trend will require considerable reorientation of production and marketing procedures and installation of more equipment.

While a number of the larger furniture-manufacturing firms in the North Central Region are making some use of dimension stock in place of rough or finished board lumber, the use of other highly processed wood parts made outside the furniture plant is still limited. Table 15 shows that only a few of the 1,106 firms purchased some premanufactured wood parts, excluding dimension stock. About 15 percent purchased some turnings, 20 percent purchased molding, and 7 percent purchased other kinds of wood parts. Purchases of wood turnings were made more frequently by firms manufacturing case goods. Upholstered furniture manufacturers ranked second. Moldings purchases were concentrated in the case goods sector. Purchases of other kinds of premanufactured parts were equally important in the case goods

Table 15. — Furniture Manufacturers' Use of Premanufactured Wood Parts, Excluding Dimension Stock, in the North Central Region in 1964

Percent of 1964 wood purchases in the form of premanufactured parts	Turnings	Moldings	Other
<i>Number of firms</i>			
0.....	913	858	1,002
1 to 19.....	59	56	3
20 to 39.....	11	46	8
40 to 59.....	21	18	3
60 to 79.....	8	0	9
80 to 100.....	63	97	50
Not available.....	31	31	31
Total.....	1,106	1,106	1,106

and upholstered furniture sectors which together accounted for almost all such purchases.

Even though furniture manufacturers in the North Central Region have not carried the use of premanufactured lumber very far, they no longer purchase green lumber and do their own seasoning to the extent they did in the past. Over the Region as a whole, 8 percent of softwood lumber and about 80 percent of all hardwood lumber was purchased kiln-dried; 12 percent and 17 percent, respectively, was purchased air-dried. Thus only about 2 percent of all softwood lumber and 4 percent of all hardwood lumber was purchased green and seasoned in furniture-plant kilns or yards. The savings effected by transporting dried rather than green lumber and in eliminating expensive drying in furniture-plant kilns are substantial. Furniture manufacturers can no longer afford to do their own seasoning to any extent.

Most firms in all SIC categories purchased their softwood lumber as kiln- or air-dried regardless of size of firm. Only two firms reported purchases of green softwood lumber. The purchase of green hardwood lumber is somewhat more common, however, but only among the larger firms, particularly in SIC 2521 and SIC 2531.

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Large firms purchasing air-dried hardwood lumber....	23	29	39	22
Large firms purchasing kiln-dried hardwood lumber...	70	65	35	63
Large firms purchasing green hardwood lumber.....	7	6	26	15

Furniture manufacturers use many different kinds of wood in the form of lumber. Some species are more important in one SIC than in another as shown by the data in Table 16. Among the softwoods, southern pine, ponderosa pine, and Douglas fir are important in all SIC categories. Ponderosa pine is widely used in the case goods industry, followed by southern pine and Douglas fir. In the manufacture of upholstered and public building furniture, Douglas fir is favored for framing because of its uniform texture and great strength. Southern pine appears to be favored in the wood office furniture sector. None of these species are abundant in the forests of the North Central Region, and these kinds of lumber must be imported from the South and West.

Among the hardwoods, oak, hard and soft maple, gum, and yellow poplar-basswood are the most important. Yellow poplar is especially important in the case goods industry. Oak is the most important single

Table 16. — Ranking of Species of Lumber Used
in Furniture Manufacturing in the United States
by SIC Category in 1960

Species	SIC category			
	2511	2512	2521	2531
<i>Softwoods</i>				
Douglas fir.....	3	1	6	1
Western hemlock.....	7	6	2	..
Eastern pine.....	8	7	4	5
Ponderosa pine.....	1	3	7	3
Southern pine.....	2	2	1	2
Redwood.....	5	..	..	7
Spruce.....	6	5	3	6
Other.....	4	4	5	4
<i>Hardwoods</i>				
Alder.....	6	4	12	7
Ash.....	9	5	11	12
Basswood-poplar.....	1	6	2	3
Beech.....	11	12	8	6
Birch.....	7	7	10	4
Cherry.....	8	17	15	13
Elm.....	13	9	9	5
Gum.....	7	3	4	10
Hackberry.....	15	14	..	..
Magnolia.....	18	11	14	..
Hard maple.....	5	8	4	2
Soft maple.....	3	2	7	9
Other maple.....	17	18	..	..
Oak.....	4	1	1	1
Pecan.....	10	16	6	..
Sycamore.....	16	13	16	..
Walnut.....	12	15	3	8
Other.....	14	10	13	11

Source: (12, Table 4).

species of hardwood lumber used in the manufacture of upholstered wood office and public building furniture. Walnut lumber is important only in the wood office furniture industry. Walnut is often used as a face ply in other types of furniture except upholstered.

Lumber quality requirements also vary by SIC. Except in public building furniture and unfinished furniture, the softwood lumber used in furniture manufacture is often hidden and quality requirements need not be high, at least so long as strength is not sacrificed. The following data (13, Table 5) show the percentages of high-, medium-, and low-quality softwood lumber used in furniture manufacture in 1960:

	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>			
High quality.....	26	5	2	67
Medium quality.....	37	62	80	25
Low quality.....	37	33	18	8

A significant proportion of softwood lumber used in the making of case goods and upholstered furniture can be of low quality. On the other hand, the volumes of medium-quality softwood lumber needed in the manufacture of upholstered, and especially wood office furniture, are much greater. Softwood lumber used in public building furniture must often be of high quality either because it is exposed to view or because it must be strong.

The manufacture of all four kinds of furniture required medium-quality hardwood lumber, for the most part:

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
High quality.....	24	11	21	55
Medium quality	68	80	74	38
Low quality.....	8	9	5	7

As with softwood lumber, much of the hardwood lumber used in public building furniture must be of high quality. As would be expected, almost all hardwood lumber used in wood office furniture and case goods has to be of medium or high quality because much of it is exposed to view. Some of the hardwood lumber used in upholstered furniture is also exposed to view and must be good-quality material. However, most hardwood lumber going into chair and sofa frames must be reasonably strong and hence of at least medium quality.

The above data on lumber species and quality requirements in furniture manufacture are on a national basis for a specific year, 1960. As noted earlier, it is estimated that the North Central Region accounts for about 25 percent of all wood materials used in furniture manufacture. Furthermore, because manufacturers of the four kinds of furniture covered by the above data are well represented in the Region, it is probable that the general patterns of lumber species used and quality requirements prevailing nationally in 1960 were also applicable to the Region in that year.

The respondents in this study were asked if they had changed the kinds of lumber used in the period, from 1959 to 1964. Over 72 percent (798 firms) reported no change, about 27 percent reported some change, and about 1 percent did not know. According to the following information, most of the reported change in lumber species mix occurred in the wood office and public building furniture sectors, and the least in the upholstered furniture sector:

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Firms reporting no change.....	73	81	62	64

Some possible reasons for the change in lumber species used as well as the changes occurring in the general mix of raw materials used in furniture manufacture are discussed on page 60.

The specific shifts in species used over the period from 1959 to 1964 correspond to changes in supply areas. Availability has been the key factor in these shifts. For example, walnut and cherry are no longer readily available in the lengths desired, and substitutions are often made. In one case, a shift was made from soft maple to poplar because the availability of poplar during the winter eliminated an inventory problem connected with the use of soft maple. In a few cases, shifts from one species to another were related to buyer specifications. It is probable that buyer and designer specifications will become more important in the future in selecting species of woods.

Softwood plywood, hardwood plywood, hardboard, and particleboard have all become important wood materials in furniture manufacture, especially as substitutes for lumber. The use of these materials has made possible some savings in the costs of materials and labor. Even with these panel materials, which come in standard sizes and thicknesses, some firms have found it expedient, less wasteful, and hence cheaper to purchase only those sizes that are required. Over the North Central Region, most firms (92 percent) purchase softwood plywood in standard-size sheets. However, about 19 percent of all firms purchase hardboard and particleboard and over 26 percent buy hardwood plywood in specified dimensions. This practice varies by SIC as shown by the following tabulation:

	SIC 2511		SIC 2512	
	Standard size	Specified dimension	Standard size	Specified dimension
	<i>Percent</i>			
Hardboard	82	18	81	19
Particleboard	84	16	71	29
Softwood plywood	93	7	85	15
Hardwood plywood	75	25	77	23
	SIC 2521		SIC 2531	
	Standard size	Specified dimension	Standard size	Specified dimension
	<i>Percent</i>			
Hardboard	64	36	78	22
Particleboard	64	36	73	27
Softwood plywood	100	0	96	4
Hardwood plywood	60	40	70	30

Softwood plywood is almost always purchased in standard-size sheets. However, a significant percentage of all firms purchase hardwood plywood in specified dimensions. This practice is also fairly common with particleboard and hardboard purchases. The practice of buying wood panel products in predetermined sizes is much more common among large firms than it is among the small ones.

Wood Materials Supply

Table 17 shows the market sources of lumber used by furniture manufacturers in the North Central Region in 1964. A relatively few firms, almost always the larger ones, operate their own sawmills (often located in the Southern or Appalachian States) in order to insure all or part of their lumber requirements. It has not been common for furniture manufacturers to insure wood raw material supplies by timber or mill ownership. No evidence regarding trends was obtained, but it is probable that more furniture manufacturers will consider some kind of arrangements to improve raw material availability. With increasing size and complexity of furniture-manufacturing establishments, volume and quality needs will rise, thus making mill ownership or formal purchasing agreements with reliable supply agents more attractive.

Purchasing lumber directly from independent sawmills is the common practice, but wholesalers who stock various kinds and sizes of lumber and often have central locations are the most important sources of lumber. Most small furniture manufacturers make their lumber purchases through wholesalers, although commission men are also relatively important. Most wood furniture manufacturers are serviced by sales representatives for their raw materials inputs. Many small firms purchase their supplies from retailers reflecting the relatively low volumes required. The reliance on wholesalers and, to a degree, retailers points up the emphasis small firms place on the stability of this market service.

Table 17. — Market Sources of Lumber Used by Furniture Manufacturers in the North Central Region in 1964

Percent of total lumber used	Source				
	Own sawmill	Independent sawmill	Whole- saler	Commission agent	Other
<i>Number of firms</i>					
1 to 19.....	8	51	61	28	12
20 to 39.....	2	38	44	22	4
40 to 59.....	3	38	36	16	3
60 to 79.....	3	35	32	10	1
80 to 100.....	22	199	512	93	68
Total.....	38	361	685	169	88

An examination of the data by kind of furniture manufacturer shows some variation in the regional lumber supply source pattern:

	SIC2511	SIC2512	SIC2521	SIC2531
	<i>Percent</i>			
Own sawmills	3	2	0	1
Independent sawmills	19	33	34	18
Wholesalers	63	37	51	65
Commission agents	9	11	9	14
Others	6	17	6	2

Only about 6 percent of all the furniture-manufacturing firms in the Region stated that they had made some change in lumber supply agents over the past 5 years. About 8 percent could not answer the question and 86 percent reported no change. These values do not vary significantly by kind of furniture manufactured and the data do not reveal any particular pattern to the shift in supply agents. Most shifts appear to be from one supplier to another supplier of the same type rather than from one type of supplier to another. Price was the reason for change in a few cases, but volume, consistency of quality, and other nonprice factors were more significant.¹ Where shifts have occurred, the reason most often stated was that supply sales representatives did not do an adequate job.

About 65 percent of all softwood lumber is shipped to furniture manufacturers by rail and the rest comes by truck. Because hardwood lumber sources are generally closer to the firms in the region, over 80 percent of this material is shipped to furniture manufacturers by truck, the rest coming by rail. The data below indicate that there is little divergence from the figure for hardwood lumber shipments, even when the several SIC categories are considered separately. There is some variation in the mode of softwood lumber shipment.

	Softwood lumber				Hardwood lumber			
	SIC 2511	SIC 2512	SIC 2521	SIC 2531	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>							
Firms receiving lumber shipped by truck	64	77	85	47	81	84	78	82
Firms receiving lumber shipped by rail	35	17	15	52	19	14	22	18
Firms receiving lumber shipped by other means	1	6	0	1	0	2	0	0

¹ The Michigan substudy of this project concluded that price was important. See (4).

The higher percentages of firms in SIC 2512 and SIC 2521 receiving softwood lumber delivered by truck probably indicate the purchase of softwood lumber made from native softwood timber within the Region (Minnesota, Michigan, and Wisconsin) or from large, centrally located wholesalers selling both native softwood lumber and rail-shipped material from the South and West, final delivery being made by truck. A few firms receive some lumber shipped by other means, probably by water.

For the Region as a whole, about 73 percent of all firms received hardboard shipments by truck. Sixty-seven percent got their particleboard this way, 70 percent their softwood plywood, and over 80 percent received plywood shipped by truck. Although some hardboard, particleboard, and hardboard plywood is made within the North Central Region, most of what furniture manufacturers use comes from outside. Very little, if any, softwood plywood is made within the Region.

Delivery of all types of panel products to case goods manufacturers appears to be mostly by truck (65 to 80 percent) and to upholstered furniture makers almost exclusively by truck (90 to 97 percent). However, about 30 to 45 percent of all the makers of wood office and public building furniture receive hardboard and particleboard purchases by rail. These two categories contain a higher percentage of large firms than do the case goods and upholstered furniture categories. Higher deliveries of panel products by rail may reflect size of raw-materials purchases, particularly if there are savings involved in volume shipments.

The extent to which furniture manufacturers in the North Central Region purchase wood raw materials originating outside their respective states is shown by the data in Table 18. Of the firms who used the

Table 18. — Number of Furniture-Manufacturing Firms in the North Central Region Purchasing Wood Raw Materials Made Outside the State in Which the Firm Was Located in 1964

	Softwood lumber		Hardwood lumber		Hardboard		Particle- board		Softwood plywood		Hardwood plywood	
	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent
Firms purchasing materials made outside the state.....	460	89	636	79	288	89	360	96	553	97	524	87
Firms purchasing materials made within the state....	58	11	171	21	35	11	14	4	18	3	76	13
Total	518	100	807	100	324	100	374	100	571	100	600	100

materials and who could answer the question, 89 percent said they purchased softwood lumber originating outside their state, 79 percent indicated that their hardwood lumber came from outside, 89 percent used out-of-state hardboard, 96 percent used out-of-state particleboard, 97 percent used out-of-state softwood plywood, and 87 percent used out-of-state hardwood plywood. Some of these materials are manufactured within the Region. However, it is likely that most of these materials are manufactured outside the North Central Region, although the evidence is not explicit.

Furniture makers in the Region gave several reasons for their out-of-state wood raw materials purchases. With regard to out-of-state purchases of lumber, the reasons given are shown in Table 19. Price advantage does not appear to be an important reason for either softwood or hardwood lumber purchases. On the other hand, reasons relating to quality, quantity, and reliability of supply accounted for about 64 percent of responses in the case of softwood lumber and over 70 percent for hardwood lumber. The data below summarize the responses by kind of furniture manufacturer in percentages of firms answering in each category.

	Softwood lumber				Hardwood lumber			
	SIC 2511	SIC 2512	SIC 2521	SIC 2531	SIC 2511	SIC 2512	SIC 2521	SIC 2531
	<i>Percent</i>							
Technical reasons	6	0	0	5	5	1	5	9
Quantity of supply								
is good	10	20	35	40	26	37	39	29
Quality of supply								
is good	26	23	4	14	24	15	5	14
Established supplies .	20	47	35	16	19	23	26	23
Price	20	7	4	18	13	21	10	8
Other	18	3	22	7	13	3	15	17

Table 19. — Reasons Given for Purchase of Out-of-State Lumber by Furniture Manufacturers in the North Central Region in 1964

	Softwood lumber		Hardwood lumber	
	Number of firms	Percent	Number of firms	Percent
Technical reasons	20	4.3	32	4.9
Quantity of supply is good	102	22.1	193	29.5
Quality is good	99	21.3	133	20.3
Established supplies	95	20.5	140	21.4
Price factors	74	15.9	90	13.8
Others	74	15.9	66	10.1
Total	464	100.0	654	100.0

Neither price nor special technical wood requirements appear to be important in explaining out-of-state lumber purchase regardless of SIC category. Instead factors relating to supply are most important. Quantity of supply appears to be more important than quality considerations. It will be recalled that, except for public building furniture, most lumber going into furniture can be of medium quality. However, it appears that the suppliers must be reasonably dependable in order that manufacturers may be able to meet their production schedules. Many sawmills within the North Central Region are too small to meet the needs of furniture manufacturers, and concentration yards are not well developed.

The relative importance of the reasons furniture manufacturers in the Region gave for purchasing out-of-state wood-based panel products are given in Table 20. In general these results are comparable to those for lumber except that quality considerations are less important. This is to be expected because the quality of wood panel products does not vary as much within a given grade and size as does that of lumber. The relative importance of the several factors, when examined by kind of furniture manufacturer, does not differ significantly from the Regional pattern given in Table 18.

Furniture manufacturers in the North Central Region have not made major changes in their wood raw materials supply areas in recent years. Over 77 percent of all firms reported no change between 1959 and 1964, about 10 percent reported some change, and about 13 percent could not or would not answer the question. According to the following data, any change that has occurred has taken place primarily within the wood office furniture sector of the industry:

	<u>SIC2511</u>	<u>SIC2512</u>	<u>SIC2521</u>	<u>SIC2531</u>
	<i>Percent</i>			
Change in supply areas.....	10	14	22	9

Within the North Central Region, Minnesota and Wisconsin have recently become more important as supply sources for aspen (poplar), pine, and some of the northern hardwoods. Supplies are thought by the manufacturers to more available in these states than in Michigan. In the responses, there is some evidence of a shift in obtaining supplies of oak from the Appalachian area rather than from Southern supply areas because textural qualities are believed to be superior and price about the same. Quality and constancy of supply appear to be more important than price in most shifts of supply areas. Also, among furniture manufacturers in the Region generally, there is increased interest in the exotic African and South American tropical hardwoods because

Table 20. — Reasons Given for Purchase of Out-of-State Wood-Based Panel Products by Furniture Manufacturers in the North Central Region in 1964

	Hardboard		Particle-board		Softwood plywood		Hardwood plywood	
	No. of firms	Per-cent	No. of firms	Per-cent	No. of firms	Per-cent	No. of firms	Per-cent
Technical reasons.....	18	5.3	21	5.9	13	2.3	11	2.1
Quantity of supply is good.....	75	26.4	97	27.2	147	26.3	137	26.0
Quality is good.....	13	4.6	28	7.8	39	7.0	79	15.0
Established supplies.....	97	34.2	96	26.9	151	27.1	148	28.2
Price factors.....	40	14.1	56	15.7	91	16.3	82	15.6
Others.....	41	14.4	59	16.5	117	21.0	69	13.1
Total.....	284	100.0	357	100.0	558	100.0	526	100.0

of increasing prices for the traditional woods like walnut, cherry, and teak.

Earlier it was postulated that even though some of the wood raw material used in furniture manufacture in the North Central Region originates within the Region, much of it comes from outside. Factors relating to reliability of supply were found to be most important in explaining out-of-state purchases of wood raw materials. Adequacy of supply and reliability of delivery of wood raw materials to industry are related to the composition, quantity, and quality of the timber resource in a particular supply area. The timber resources and the related primary forest-products industries of the North Central Region do not compare well with those in the New England, Middle Atlantic, Southern, or Western States. The softwood timber volume in the North Central Region (22.5 billion board feet) (Table 21) represents only 1 percent of that to be found in the West (1.8 trillion board feet), about 9 percent of that in the South (224.8 billion board feet), and about 50 percent of that in the New England and Middle Atlantic States (44.1 billion board feet). Even though the quality of softwood timber in the North Central Region generally is higher than the timber in the Middle Atlantic, New England, and Southern States, the volume is too low to support competitive softwood lumber and plywood industries, except in certain localities. Most of the softwood lumber used in furniture manufacturing in the North Central Region comes from the South and West.

The North Central Region is in a somewhat better competitive position in hardwood production, but even here its position is not strong. The Region's hardwood timber volume is about 8 percent greater than that of the New England and Middle Atlantic States combined, but only

65 percent of that of the Southern States. Many of the furniture hardwoods used in the North Central Region and elsewhere originate in the Middle Atlantic States, particularly the Appalachian area (eastern Kentucky and Tennessee, North Carolina, Virginia, West Virginia, New York, and Pennsylvania). The species in particular demand from this area are red and white oak, yellow poplar, cherry, ash, walnut, basswood, beech, birch, and maple. The overall quality of the hardwood timber in New England and the Middle Atlantic States is higher than in either the North Central Region or the South as is shown in the following tabulation (volumes in millions of board feet).

Grade	North Central Region		New England and Middle Atlantic States		Southern States	
	Volume	Percent	Volume	Percent	Volume	Percent
1	9,906	8	20,845	18	16,992	9
2	17,496	14	25,056	21	35,731	19
3	80,942	66	43,855	39	78,653	42
4	15,171	12	24,264	22	55,937	30
Total	123,515	100	114,020	100	187,313	100

Even though there is a greater total volume of hardwood timber in the North Central Region than in New England and the Middle Atlantic States, the second-growth timber of the Region contains only about one-half as much volume in tree grades 1 and 2. This situation will change, however, as small, quality timber grows into higher-quality 16- to 18-inch timber. The North Central Region is the source of some hardwood lumber used in Regional furniture manufacture, but hardwood plywood needs must be met largely from sources in the Middle Atlantic and Southern States for the next few years. Similarly, some hardboard and particleboard is made in the Region. However, particleboard is made mainly from wood residues resulting from the manufacture of lumber and plywood. Its production is therefore much more important where these industries are concentrated. Hardboards can be made not only from wood residues but also from cordwood. At present, only a relatively small volume of hardboard is made in the North Central Region. Certainly the necessary wood resources exist in the Region, and it is possible that this material will eventually be manufactured in greater volume in the Region. Whether the Region will produce more hardwood timber of a grade suitable for high-quality lumber and for plywood depends upon the future management of the Region's forest resources.

Trends in Wood Use

In 1948, about 2.4 billion board feet of lumber were used in the manufacture of furniture and fixtures in the United States. By 1965, about the same amount (2.3 billion board feet) was used despite a large increase in the volume of furniture manufactured. The use of plywood, hardboard, and particleboard increased significantly over this same period.

The relative decrease in lumber used for furniture cannot be explained by a decrease in output of furniture because between 1950 and 1960 the index of production of furniture and fixtures increased from 79.1 to 115.5 (1957-1959 = 100) (14, p. 38). The index is based on value of furniture and fixtures produced. Furniture is made of other materials in addition to wood and also reflects labor and materials costs changes over time.

In 1948, the volume of lumber used per dollar of sales value of household furniture was 0.977 board feet. In 1960, this volume had fallen to 0.650 board feet, and by 1962, to 0.615 board feet (12, p. 36). For institutional and commercial furniture (including wood office and public building furniture), the volume of lumber fell from 0.318 board feet per dollar of sales in 1948 to 0.266 board feet in 1960 and to 0.255 board feet in 1962.

The decrease in lumber use appears to be related to changes in furniture styles over time and to the substitution of other materials for lumber for reasons not necessarily connected with style change. According to Robinson (8), furniture manufacturers believe that most of the reduction in lumber use has been due to style changes. During the 1920's, modern furniture was introduced and became quite popular. Because these modern styles were much heavier and bulkier than the traditional styles they replaced, use of wood for furniture increased relative to the level of furniture production up to about 1947. After that time, however, modern furniture has tended toward the lighter-weight, slender styles, and lumber use has declined.

Despite increased furniture output and the increasing popularity of Early American and Provincial styles (Mediterranean, Italian, French, and Spanish) which require more wood, less lumber has been used. The explanation would seem to be that other materials such as particleboard, plywood, hardboard, steel, aluminum, and plastics are being used in place of lumber. Although these materials have been substituted for lumber because of cost savings in many cases, some of the substitution has been connected with the development of certain ultramodern styles.

Of the 1,106 firms in the furniture industry of the North Central Region, only 62 (5.6 percent) said they had substituted wood for nonwood materials in the manufacture of their products between 1959 and 1964. However, 320 firms (28.9 percent) stated that they had substituted nonwood for wood materials such as metals and plastics (Table 22). The following tabulation shows substitution of nonwood for wood materials by percent of firms in each SIC category:

	SIC2511	SIC2512	SIC2521	SIC2531
	<i>Percent</i>			
Firms substituting nonwood for wood materials.....	33	13	24	41

In the North Central Region, over 40 percent of the firms making public building furniture have substituted nonwood for wood materials. Substitution has also been fairly heavy in the case goods industry. As one would expect, the upholstered furniture industry shows the lowest proportion of firms substituting nonwood for wood materials. There is less latitude for substitution in this sector, although some styles incorporate metal framing and metal legs, either entirely or to a marked degree. According to some manufacturers in the region, metal table legs have received solid consumer acceptance and the substitution was required, particularly in lower priced lines, to remain competitive. Because of durability and consumer preference, pressure-plastic laminates have become a major wood replacement over the past 5 years. In a few cases, cost alone was cited as the reason for substitutions. However, more often the qualities possessed by the nonwood materials are being demanded by consumers, especially in lower-priced household furniture.

Table 22. — Substitution of Raw Materials in Furniture Manufacturing in the North Central Region During the Period from 1959 to 1964

	Wood substituted for nonwood materials		Nonwood materials substituted for wood	
	Number of firms	Percent	Number of firms	Percent
Yes.....	62	5.6	320	28.9
No.....	1,042	94.2	781	70.6
Not available.....	2	0.2	5	0.5
Total.....	1,106	100.0	1,106	100.0

According to Robinson (8), steel and aluminum are being increasingly used in the furniture industry generally. Where the kind of furniture made can be standardized (office desks and chairs, for instance), wood materials do not fare very well against the use of the metals. For example, between 1947 and 1958, the value of wood office furniture shipments increased by about 30 percent while the value of metal office furniture rose 127 percent. Metals, plastics, and fabrics have also been widely substituted for lumber in porch, lawn, kitchen, and dinette furniture, primarily because of weather resistance and ease of cleaning. Lumber's position in the public building furniture sector has also been weakened in recent years because plastics offer homogeneity of color, low maintenance cost, and appealing appearance in new designs. In school furniture, for example, plastics are replacing lumber and plywood once used in seats, backs, and writing surfaces. Theater and auditorium seats have also mainly gone to metal, plastics, and fabrics.

In the furniture industry generally, particleboard is the most important wood material being used in place of lumber, primarily because of its dimensional stability, smoothness, and economy as a core stock material where the overlay is wood veneer or a plastic. Hardboard is also being widely substituted for lumber and plywood, often with a plastic or paper wood grain reproduction overlay.

Robinson (8) attempted to evaluate the impact of style change and substitution of other materials on the use of lumber in the furniture industry. According to his findings, substitution accounts for most of the decline in lumber used for wood office, public building, and other nonhousehold furniture and fixtures. Lumber has lost out primarily to increased use of metals and partly to increased use of the wood-based sheet materials. The switch to metals and wood sheet materials has been made possible by the relatively high degree of product standardization possible in these industries. Product standardization is much easier with office and public building furniture because these products are frequently purchased for utility in use rather than aesthetic appeal.

With respect to household furniture, substitution may have accounted for a much smaller part of the decline of lumber use in furniture and style change may have been much more important. As noted earlier, household furniture is purchased not only for its utilitarian value, but also for its artistic and decorative appeal. It is thus supplied in a wide choice of styles, designs, qualities, and prices, and it is made of a number of different materials. Standardization of the product and even relatively long production runs of any particular piece are not common.

Even though lumber has an initial advantage over nonwood materials when retooling becomes necessary as furniture styles change, this advantage is lost to a significant degree because wood furniture itself involves much expensive hand labor, especially in the finishing process. The move to materials other than lumber in the household furniture industries has been augmented by rising labor costs. So long as lumber prices and wages continue to rise faster than furniture prices, manufacturers will want to substitute those materials whose cost in place is lower than it would be if lumber were used. This process is likely to be extended as long as manufacturers, designers, and the public consider it to be consistent with furniture style trends.

Furniture manufacturers in the North Central Region believe that the future effects of past and current furniture design trends on the use of wood materials are likely to be mixed. Design trends in ultra-modern and low-priced furniture suggest a continued shift away from wood, particularly lumber, toward other materials. However, firms that produce traditional and some contemporary styles will continue to use about the same amount of wood per piece. The total amounts of wood materials used in furniture manufacture in the future and their relative importance will depend primarily on style preferences, and the industry's success in lowering production costs. Style preferences will probably be greatly influenced by the expected changes in social and economic status of the furniture-buying public under the impact of increased education and a rising standard of living. Whether or not production costs are lowered depends on how far furniture-making technology progresses and how the industry in general is restructured for greater production, marketing, and management efficiency.

The practice of using or selling wood residues that result from the furniture-manufacturing process is by no means universal in the North Central Region. Of the 1,106 firms in the region, only 398 (36 percent) made some use of wood residues in 1964. Over half of these firms used their wood residues as fuel in the power plant, 25 percent manufactured wood residues further for use in the furniture-manufacturing process, and the rest sold the material as chips, shavings, or blocks to other wood-using industries (primarily pulp products manufacturers). Utilization of wood residues was more common with firms making wood office furniture (68 percent) and public building furniture (45 percent). Thirty-eight percent of case goods manufacturers and 24 percent of upholstered furniture manufacturers utilized wood residues. Most firms used these materials for fuel. About one-third of all firms producing upholstered and public building furniture made further use of

their wood residues in the furniture-making process itself. Sales of wood residues by furniture plants appeared to be important only in Wisconsin. Not only does Wisconsin have more furniture plants than any other state in the North Central Region, but Wisconsin is also a very important pulp- and paper-producing state. Some furniture plant wood residues in this state are no doubt going into wood-pulp production.

SUMMARY AND CONCLUSIONS

The wood furniture industry in the North Central Region is, in many respects, an example of perfect competition. The industry has many members, entry and exit are relatively easy, and individual firms seldom influence the market in any important sense. Operators in the furniture industry consequently suffer the many disadvantages often associated with such competitive structures. There are, however, signs of major changes in the industry, and these changes may accelerate rapidly in the near future.

Wood will be less important as a raw material in the future. It will retain its position in period furniture and where its technical or design characteristics continue to be superior to nonwood alternatives. But lower costs for alternative raw materials, greater ease in manufacture, and quality control and changes in consumer tastes generally favor increased substitution for wood. Wood raw materials originating in the North Central Region may play a decreasing role in the coming few years. Some efforts can be made in manufacturing furniture using wood species common to this region, but shortness of supplies in the Region and superior alternative sources suggests that little change is possible in the Regional raw material picture until second-growth timber moves into higher-quality classes.

Some major changes are possible in the furniture industry of the North Central Region. These changes have important implications for wood use in the aggregate wood furniture industry and, in particular, for use of North Central Region wood resources in the Region's furniture industry.

An economic interpretation of the transition provides a clearer view of what to expect in the future. The production function for any furniture piece may be visualized in terms of three major dimensions—labor, capital in the form of machinery, and raw materials. The latter dimension obviously is composed of several subdimensions representing the various possible wood and nonwood materials. The aggregate mix of raw-material inputs at any point in time is dependent on wages,

prices and productivity of labor, and capital. Significant shifts in the mix would be expected with major changes in these parameters.

Two obvious, interrelated characteristics of contemporary American industry are rapid increases in wage rates and increasing capital investment per worker employed. The increased capital makes the worker more productive, more valuable, and thus better paid. But the higher wages in turn encourage substitution of more capital for labor. This shift is emphasized by generally falling relative prices for capital goods, and is reflected in rising productivity for both labor and capital.

The shift toward machinery has implications for the raw materials mix even if the prices of raw materials remain unchanged. Inputs that are more homogeneous and consistent in character enable capital goods to perform better. Thus furniture manufacturers are expected to shift away from lumber toward plywood, particleboard, and other more uniform wood materials. In some cases, shifts will be made to nonwood materials like metals and plastics for similar reasons. When prices for lumber or wood products generally rise relative to other inputs, this shift in the raw materials mix is hastened. These changes are not favorable to wood use in the furniture industry generally or specifically in reference to the North Central Region.

Two major factors influence economies of scale. First, capital-oriented production processes tend to have economies of scale and capital markets may strongly favor larger firms. Larger firms also have more opportunities for raising capital internally via retained earnings. Second, managerial quality, including technical skills such as engineering, quality control, and design, require large-scale production units to cover the associated overhead costs.

The advantages of capital access and managerial quality favor a shift toward larger firms in the furniture industry. It is quite likely that this trend will be the most significant shift in the wood furniture industry in the future. With the shift, less wood will be used per unit of furniture and there will be increased demands for homogeneity of wood characteristics. Except for some possible design innovations favoring North Central Region wood species and increasing production of chip boards suitable for the industry, the shift from wood will be strongly against Regional suppliers. Producers of custom-made and traditional furniture will continue to use quality wood inputs. Their designs are less subject to change, and the market served is little concerned with the price impact of labor and raw materials costs. This stable wood market will be the exception to an otherwise downward trend.

While the per-unit consumption of wood will decline, aggregate consumption may increase. The continuing increase in new households, coupled with shifts to more disposable furniture types, suggests some major expansions in wood markets. North Central Region wood suppliers can share in these markets by providing stable, secure sources of wood products with specified characteristics. While price is not the most important factor, it cannot be ignored when buyers will have an increasingly sophisticated understanding of managerial control.

In conclusion, two previously known qualitative predictions are verified by these findings. First, the per-unit wood-use requirements on the average will decline in the wood furniture industry. Second, the total quantity of units sold will increase rapidly in the coming decade. A qualitative interpretation of the impact of these two forces is not possible at this time. There is evidence that the growth in aggregate demand for furniture will outstrip the decline in demand for furniture wood. The value systems of the nation's consumers, however, are in great flux. Possible changes in the political, economic, and technical environment could emphasize current trends or totally reverse the picture of the years used as a basis of this study.

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APPENDIX A: METHOD OF DATA COLLECTION

This study was undertaken to provide information on the location, size, operations, and products of the wood furniture-manufacturing industry in the North Central Region. Other major objectives included the determination of the types of wood raw materials used by the industry, its sources and requirements, and an examination of the factors influencing decisions in the choice of raw materials where wood or other materials are suitable and substitutable components.

Eight states participated in the study. They were Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. Cooperating on an advisory basis were the North Central Forest Experiment Station (U.S. Forest Service), the Wisconsin Survey Laboratory (University of Wisconsin), and the Illinois Survey Research Laboratory (University of Illinois).

Each of the eight cooperating states was responsible for compiling an in-state list of furniture-manufacturing firms covering SIC 2511 (wood furniture, not upholstered), SIC 2512 (wood furniture, upholstered), SIC 2521 (wood office furniture), and SIC 2531 (public and related furniture and fixtures). In this process each state endeavored to use the best source materials available, including directories. Despite the care exercised in this part of the study, it was recognized that the lists varied in quality because of wrong classification of firms, mergers of firms, and the entrance into or departure from the industry of firms since compilation of the data sources.

It was originally estimated that there were 1,801 furniture-manufacturing firms in the eight participating states in the summer of 1965. It was discovered, however, that there were only 1,106 such firms in operation. Of these, 363 were to be visited. The original lists were stratified by SIC number, indicating products made, and by size class. The following table shows the rates of selection for firms to be visited for each combination of SIC number and size class.

SIC number	Size class		
	1 (1 to 49 employees)	2 (50 to 99 employees)	3 (Over 99 employees)
	<i>Percent</i>		
2511.....	25	100	100
2512.....	25	100	100
2521.....	100	100	100
2531.....	100	100	100

Thus all of the larger firms (Classes 2 and 3) were included in the sample as well as all the small firms in SIC 2521 and SIC 2531. Only 25 percent of the small firms in SIC 2511 and SIC 2512 were included. A systematic, stratified sampling procedure was used in choosing the one-in-four sample firms.

The sampling rates include a margin for noncooperators, misclassified firms, and firms out of business. Not every firm in the sample was expected to yield a completed interview schedule. In fact, about 18 percent of the assigned Region-wide sample was not completed for the reasons mentioned above. It is believed that the sample yield, as completed, is adequate for Regional analysis.

The field information for this regional study was provided by personal interview. The interview schedule was developed and pre-tested by the Wisconsin Survey Laboratory in cooperation with the participating states. The interviewers (primarily graduate students) were instructed on interviewing procedures and content of the interview schedule during a training session held in Madison, Wisconsin, under the sponsorship of the Wisconsin Survey Laboratory. This agency was also responsible for coding, tabulating, and summarizing all of the Regional field data from which the analysis was made.

**APPENDIX B: ITEMS INCLUDED
UNDER SIC CATEGORIES 2511, 2512, 2521, and 2531**

SIC 2511 — Wood Household Furniture, Not Upholstered

Radio, phonograph, and television cabinets, and combinations thereof
 Other wood living room, sunroom, and hall furniture
 Sewing machine cabinets
 Other cabinets
 Chairs and rockers
 Tables (except card and telephone)
 Desks
 Credenzas, bookcases, and bookshelves
 Card tables and chairs
 Other nonupholstered living room furniture (nec)¹
 Other wood living room, library, sunroom, and hall furniture (nsk)²
 Wood dining room, junior dining room, and kitchen furniture
 Chairs
 Buffets and servers
 China and corner cabinets
 Other dining room furniture (nec)
 Breakfast sets
 Other kitchen furniture
 Other wood dining room furniture (nsk)
 Kitchen cabinets, wood, assembled, unassembled, or other
 Wood bedroom furniture
 Beds
 Headboards
 Dressers
 Chests of drawers

Cedar chests
 Chairs, rockers, benches, and chaise lounges
 Other bedroom furniture (nec)
 Bedroom furniture (nsk)
 Infants' and children's wood furniture
 Cribbs
 High chairs
 Play yards and play pens
 Other infants' and children's furniture
 Other infants' and children's furniture (nsk)
 Wood outdoor furniture and unpainted wood furniture
 Cots, folding, of wood and canvas
 Chairs, rockers, benches, chaise lounges, and steamer and deck chairs
 Other wood porch, lawn, and beach furniture
 Unpainted wood furniture (furniture in the white) including chests of drawers and other unpainted furniture
 Other nonupholstered wood household furniture
 Wood outdoor furniture and unpainted wood furniture (nsk)
 Wood household furniture, except upholstered (nsk)

¹ (nec) = not elsewhere classified.

² (nsk) = not specified by kind.

SIC 2512 — Wood Household Furniture, Upholstered

Sofas, davenports, settees, and love seats	Other upholstered wood household furniture (ottomans, hassocks, etc.)
Chairs (except reclining)	Other upholstered wood household furniture, except dual-purpose sleep furniture (nsk)
Sectional sofa pieces	Wood furniture frames for household furniture
Rockers	Wood household furniture (nsk)
Reclining chairs	
Bedroom chairs, benches, and chaise lounges	

SIC 2521 — Wood Office Furniture

Chairs and stools (including upholstered)	Desks, including executive, secretarial, and clerical
Sofas, couches, settees, etc. (including upholstered)	Cabinets and cases
	Other wood office furniture
	Wood office furniture (nsk)

SIC 2531 — Public Building and Related Furniture

School furniture, except stone and concrete	Seats for public conveyances, autos, trucks, aircraft, and school busses
Desk-seat combinations	Church pews
Chair desks	Other church furniture (pulpits, altars, lecterns, etc.)
Tablet arm chairs	Chairs and seats for theaters and auditoriums
Other single-pupil units	Stadium and bleacher seats
Multiple-pupil units	Other public building furniture (tables, benches, etc.)
Chairs, all purpose (non-folding)	Public building furniture (nsk)
Other school furniture (tables, storage cabinets, etc.) except stone and concrete	
School furniture (nsk)	
Public building and related furniture, except school furniture	

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